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WE live in a restless and progressive age. So much that is new is evolved in so short a time that in all branches of medicine there is the risk lest in our endeavours to keep abreast with the times we succumb to the temptation to lighten the load by jettisoning the sound knowledge of the past. Anticipating that among my hearers might be found a proportion of women and men about to embark in the practice of ophthalmology, I have thought that some lessons drawn from my clinical experience might be of interest and of value.

CASE 1.—In November, 1906, a boy of 17 at one of our public schools was mixing carbon, sulphur, and chlorate of potash with a pestle in a mortar when a violent explosion occurred, and all the windows of the chemical laboratory were broken. I saw the patient some six hours later suffering much from shock, with great laceration of his hands, which became permanently crippled, while powder grains were abundant in the skin of his cheeks, nose, forehead, and eyelids. Foreign particles were embedded in the cornea and sclerotic of each eye, and in the right there was a punctured wound at the highest point of the limbus. The iris was lacerated but not prolapsed and the lens wounded and becoming opaque. A good anterior chamber was present, and the eyelids were ecchmyosed and œdematous. It was not until three weeks later that his general condition allowed me to deal with the traumatic cataract. Two examinations with X rays had failed to show the presence of any intra ocular foreign body, but on evacuating the soft cataract a small fragment of porcelain appeared through a rent in the posterior capsule of the lens, and I was able to pick it out with forceps through the corneal incision. A small quantity of vitreous was lost. The eye subsequently did very well, and with correction for its aphakia obtained full direct vision, and to my knowledge still had 6/6 nearly five years later.

CASE 2.—On the evening of Sept. 9th, 1908, in Scotland, the members of a shooting party, having had a wet day, amused themselves by throwing into the fire percussion caps which they cut from soaked cartridges. One of the explosions, more violent than the rest, resulted in the right eye of a young man being struck with some fragment but whether of coal, stone, or copper could not be determined. The next day the ophthalmic surgeon whom he consulted in the nearest large town advised immediate removal of the eye. The patient, however, decided to come to London, and I saw him two days after the accident. His right eye presented a large irregular gaping wound in the sclerotic through which vitreous was protruding. The wound was situated to the nasal side and over the posterior part of the ciliary body. The aqueous chamber was deep, as the result of the loss of vitreous, and contained a little blood. Use of X rays was obviously undesirable until the wound became solid, and I sent the patient immediately into a nursing home to maintain absolute rest. The next day the anterior chamber was very deep, in consequence of more vitreous having exuded in spite of my attempt to draw the wound together and protect it with ocular conjunctiva under a general anæsthetic. I bandaged both eyes and ordered that he be kept entirely recumbent and at rest on his back, but the patient was young and not very precise in observing my instructions. The scleral wound, however, healed slowly. On October 5th, 1908, an X ray examination was made by the later Sir Mackenzie Davidson, who reported that there was no foreign body present, either in the eyeball or the orbit. The eye was left slightly astigmatic but had 6/6 vision with a weak cylinder lens. By the end of the year he was again shooting and playing golf, and the eye kept permanently well.

These two cases indicate that detachment of retina need not by any means follow when healthy vitreous is lost, either anteriorly or through a wound of the sclerotic. In each instance the flying particle which inflicted the ocular wound—in the first case retained, in the second not retained within the eyeball—was no doubt sterilised by the heat engendered by the explosion. This fortunately is also the case where fragments of flying steel or other metal injure the eyes of workmen when chipping metal or grinding tools in engineering shops; the fragments often come off at a white heat from the impact of a steel hammer on a steel chisel.

Infection through a penetrating wound from a dirty conjunctival sac, producing panophthalmitis resulting in loss of the eye, may be a secondary complication. The conjunctival sac is particularly liable to be septic in the presence of a lacrymal mucocele. In all cases of extirpation of the lacrymal sac, and especially when this is performed preparatory to an operation involving section of the eyeball, I advise that both canaliculi be slit and their lining membrane destroyed with the galvano-cautery. I once lost an eye upon which I had operated for cataract; the eye became infected owing, I believe, to neglect of this supplement to the operation of excision of the lacrymal sac. The conjunctiva had been pronounced sterile by the bacteriologist after I had excised the sac preparatory to cataract extraction. When the eye suppurated after extraction the same bacteriologist found that it had been infected with a pneumococcus, one of the commonest and most virulent organisms lurking in a lacrymal sac mucocele. I have no doubt that the pneumococcus was lying low in the canaliculi, escaped the observation of the bacteriologist, and made its attack from this quarter upon the eyeball. The lesson is that the canaliculi should in all cases be dealt with at the same time as the sac.

Unfortunately every ophthalmic surgeon is only too familiar with the disastrous results which follow injuries inflicted with septic material. Suppurating corneæ or panophthalmitis are frequently met with in farriers, road-menders, and masons, in whom a traumatic ulcer or a perforating wound has been produced by such septic material as the parings from a horse's hoof or by flying fragments of stone.

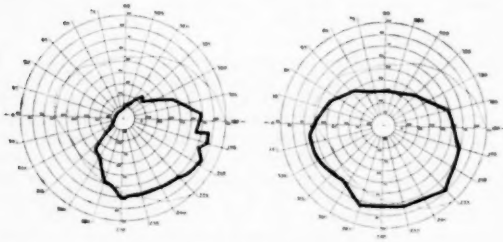
CASE 3.—Another case of traumatic cataract was that of a boy of 13, who was boiling fluid in a glass flask in a chemical laboratory when the flask burst. He only came under my observation at the hospital 17 days later, by which time a traumatic cataract in the left eye was present. There was a linear scar in the cornea running downwards and inwards; a posterior synechia of the lower pupillary margin was present, and a fragment of glass a few millimetres square lay on the anterior surface of the iris below. The eye was not inflamed. The next day I removed the fragment of glass through a corneal incision. Six months later another small piece of glass revealed itself at the lowest point of the anterior chamber, and a third angular piece was cutting its way through the lower and outer part of the iris from behind. No doubt the movement of the iris membrane facilitated this. I removed the two pieces of glass through a corneal section. A month later an X ray examination showed that yet another piece of glass was wrapped up in the lens remains. At this date, with its pupil dilated, the eye, assisted by the appropriate lens, read 6/18, but with a small pupil no clear gap was available and 6/60 could not be obtained. Rather than risk displacement of this fourth foreign body into a more dangerous situation by needling the lens, I decided to leave matters as they were. There seemed but little chance of seizing the fragment, which was completely hidden. Many years later this eye remained harmless and quiet and presented a good appearance.

How so many fragments contrived to enter the eyeball, apparently through a single wound, is rather a mystery; naturally I expected but the one first apparent. It is to be presumed that a single large splinter broke into four fragments while in the act of penetrating the cornea.

CASE 4.—A lad of 17 years of age was cleaning an incandescent electric lamp bulb on Christmas Eve, 1903, when it burst, and a fragment of glass struck and penetrated his right eyeball, in this case through the sclerotic on the nasal

side behind the ciliary region. He was admitted to hospital on Christmas morning when, with the ophthalmoscope, a slip of glass could be seen lying transversely behind the lower part of the lens. I had the operating theatre darkened and, after enlarging the aperture of entrance, watched the fragment and guided my forceps by ophthalmoscopic observation until I succeeded in seizing the slip of glass and withdrawing it from the eyeball. It was an hour

FIG. 1. FIG. 2.



Case 4.—Field of vision in February, 1904. The same in June, 1904.

and a half before I was successful in manipulating the fragment so as to get it "end on" for removal; it measured ¼ in. by 1/12 in. I closed the wound with conjunctival stitches; some vitreous had necessarily been lost. A month later the eye could only count fingers at a foot, and there was a large retinal detachment. The detachment was still present in February, 1904, as the field of vision indicates (Fig. 1), but great improvement had taken place by June, 1904 (Fig. 2), and in February, 1905, I could detect no detachment. The field still showed a 10° loss above, which was sufficiently explained by a degenerative scar change visible in the extreme periphery of the fundus below. The direct vision of the eye with correction for 2·0 D. of astigmatism was 6/18.

THE VALUE OF SCLERAL SECTION.

Polished glass is little likely to carry septic infection and, as is well known, is often retained within an eye with a minimum of irritation. Case 4 further confirms the view that scleral section and considerable loss of healthy vitreous, while it may be followed by immediate displacement of retina, is quite consistent with good recovery and no permanent detachment. The difficulty I experienced in conducting the manipulative manœuvres leads me to view with amazement the experimental work of an ophthalmic surgeon who claims to have been able to introduce glass cannulæ into the central retinal artery and vein of the cat and then to measure manometrically the blood pressure in each of these vessels. Even with the help of a micro-manipulator I should at least have expected that the damage done to the vessel walls was so uncertain as to render the results unreliable.

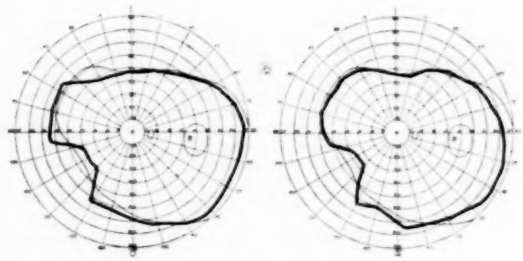
Now I come to a more ordinary case of perforating injury with retained foreign body.

CASE 5.—A man of 25 years of age was using a steel hammer on a steel chisel on Oct. 24th, 1911, when a fragment flew and injured his right eyeball. I saw him within a few hours and found a perforating wound in the sclerotic coat situated at about 6 o'clock. In the vitreous humour were some blood streaks indicating the track of a foreign body. He was sent into a nursing home, and a foreign body was revealed by X ray examination and its position located in reference to the central point of the cornea. On Oct. 26th I turned back a flap of ocular conjunctiva and inserted in the superficial layers of the exposed sclerotic two fine silk sutures, parallel to one another and about 2 mm. apart, near to the equator of the eyeball at the temporal edge of the superior rectus muscle; these stitches were left long and untied. One stitch I held taut myself, my assistant doing the same with the other while, with a Graefe's cataract knife, I cut slowly and carefully through the sclera between the two stitches until the pigmented choroid was visible. The knife was then plunged through choroid and retina, the sterilised point of the hand electro-magnet was applied to the wound, and the chip of steel was at once withdrawn. Taking at once each of the stitches into my hands I tied them together and cut them short; the conjunctival flap was then replaced and secured with fine silk stitches.

The essence of the operation is the introduction of the episcleral stitches as soon as the flap of conjunctiva has been reflected, preferably in the position indicated by the X ray measurements. While the tone of the eyeball is still undisturbed their insertion is easy. The stitches, held as directed, support the lips of the scleral incision while the sterilised point of the magnet is applied to or, if need be, introduced within the eyeball. No overflow or expression of vitreous need occur and the stitches, tied immediately after the foreign body has been extracted, close the wound securely and without delay; without them collapse of the eyeball to a greater or lesser extent is the inevitable result of the removal of a foreign body by the scleral or posterior route, and the want of this item in the technique has in my opinion unjustifiably led to the condemnation by many surgeons of this posterior operation. I am still an advocate of the scleral incision for removal of intra-ocular foreign bodies located behind the lens. We have now at our disposal very powerful electromagnets of the Haab and Mellinger type. Even when the most precise steps are followed in using these powerful tractors I consider it impossible by any means to be sure that serious damage to lens, iris, or ciliary body will not be done in pulling metallic fragments forwards into the anterior chamber from the deeper parts of the eye. I have found it quite possible to use the Mellinger pattern by the scleral route.

The sequel of the case narrated above was that on Oct. 29th some hæmorrhagic opacity could be seen in the vitreous, and two spots of recent hæmorrhage on the optic disc. The patient was kept in bed lying on his back. On Nov. 1st there was a detachment of retina in the outer periphery, but four days later it was much less obvious. On the 15th he was allowed to leave the home, and at this date no detachment could be made out. A week later there was still a little floating opacity in the vitreous. No

FIG. 3. FIG. 4.



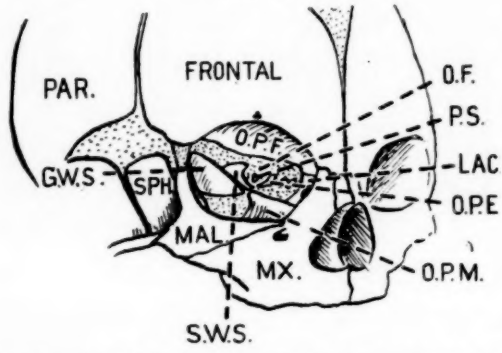
Case 5.—Field of vision in October, 1911. The same in March, 1912.

detachment of retina was visible; there was a slight notch of loss in the lower nasal periphery of the field of vision corresponding with the site of my scleral incision (Fig. 3). The central vision on Dec. 11th was 6/12, on Jan. 24th, 6/9, and on March 20th, 6/6; the field of vision on this date (Fig. 4) was practically identical with that charted on the previous Nov. 23rd. A year after the accident this eye read 6/5 fully, and I know from his relatives that up to 1926, 15 years after the accident, when I last had news of the patient, the eye remained quite well and had never at any time given the least trouble.

Radiographic examination has added much to our capacity to deal with all cases of penetrating injury to the eye by flying particles. The late Sir Mackenzie Davidson established his technique at Moorfields Hospital, and by means of his cross-thread localiser was able to give the most precise figures, even to within 0·5 mm., of the size of the retained foreign body and of its lateral, vertical, and posterior position in relation to the central point of the cornea. On one occasion I incised the sclerotic, using the method I have detailed above, at the point indicated by the figures supplied to me, and at once came down upon a piece of brass, which I picked out of the eyeball with a fine forceps.

The main objection raised by surgeons to the scleral incision is that the risk of inducing detachment of the retina is unduly great; my experience is that this fear is much exaggerated, and that the objection is invalid if the method of operating which I have explained is employed and adequate rest in bed is subsequently maintained. That displacement

FIG. 5.



Drawing of a skull of a five months' fœtus. Par. = parietal bone; G.W.S. = great wing of sphenoid; Mal. = malar bone; S.W.S. = small wing of sphenoid; O.F. = optic foramen; P.S. = presphenoid; Lac. = lacrymal bone; O.P.E. = orbital plate of ethmoid; O.P.M. = orbital plate of maxilla; Mx. = maxilla.

of retina may occur as an immediate result is not to be denied, but it is likely to be but temporary. The condition is not to be compared with spontaneous detachment of the retina, which is a manifestation of pathological processes, still unfortunately but little understood, and in which the prognosis is thoroughly unfavourable. When radiographic examination has furnished the figures, giving in three dimensions the position of the foreign body in relation to the central point of the cornea, it is necessary for the ophthalmic surgeon to satisfy himself whether the particle lies within or without the globe before he decides upon any operative procedure. This is best done by plotting its position on charts of the eyeball drawn to scale, and in 1916 I pointed out the erroneous use which we were at that date making of the measurements with which we were supplied. The age of the patient, if less than adult, has to be taken into account, while the eye is to an almost negligible degree smaller in the female than in the male sex.

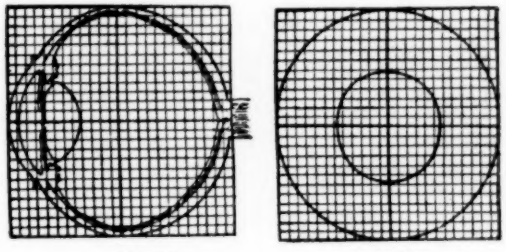
THE EYE IN INFANCY.

It is interesting to note that in the newly-born infant the eyeball is about two-thirds the size of the fully-grown globe; though an infant will multiply its weight at birth some sixteen times by the time adult life is reached, the size of its eyes increases by only some 50 per cent. The cephalic end of the embryo is of course always in advance in development; nevertheless we see nothing of contrast in the proportions of a newly-born child, though the less familiar newly-hatched fledgling from a bird's nest appears to us all head and eyes. So well is the infant's eye guarded by the bony orbit that it rarely sustains injury in the process of normal parturition; nature cannot be blamed for accidents which occur in assisted labour. The anterior outlet of the orbit at birth is quadrilateral, with fairly well-defined angles. The vertical measurement of the outlet, in contrast to that of the adult, is conspicuously less than the horizontal measurement; this diminution of the vertical height is rendered rather more noticeable by a slight upturning of the infra-orbital margin, and the lip thus formed no doubt affords some additional protection to the eyeball. The proportions of the outlet characteristic of the adult appear to be reached by a descent of the orbital floor, and not by an ascent of the roof; the supra-orbital margin in the infant bears the same relation of level to the nasion (the fixed point of the fronto-nasal suture) as in the adult. Obstetricians divide the fœtal skull into the compressible vault and the incompressible base, and in the latter category include the face. The points of ossification of the bones forming the orbit are of particular interest. The centre of ossification for the frontal bone is an early one and is found at the supra-orbital margin at the sixth or seventh week; the malar bone is one of the first in the body to ossify, while the nasal process of the superior maxilla already consists of well-formed bone some months before birth. The whole outlet of the orbit is thus well and firmly ossified before gestation is completed. For the protection of the optic nerve it is to be observed that in the sphenoid bone two centres of ossification are early laid down, one on each side of the optic foramen, about the tenth week (Fig. 5). It is also of interest to note how the nerves of common sensation proceeding through the orbit to the skin and soft tissues of forehead, temple, and cheek are throughout life safeguarded against pressure on the bony orbital margin. The supra-orbital nerve at the outlet is lodged in a notch, which is sometimes completely bridged over, while if it appears as two branches the smaller inner branch may also be lodged in a supernumerary notch. The infra-orbital nerve as it passes forward first sinks into a groove and then passes into a tunnel on the floor of the orbit to emerge at the infra-orbital foramen. The temporo-malar nerves tunnel the malar bone to deliver malar branches to the prominence of the cheek and recurrent branches to the temple. All these sensory nerves are thus protected from pressure, to which they would have been liable if they had made sharp turns on the bony orbital margin.

PLOTTING ON A CHART THE POSITION OF A FOREIGN BODY.

Fig. 6 is a reproduction of charts in use at Moorfields Hospital up to the year 1916; the circles on Chart I. represent the cornea and the maximum circumference of the eyeball in transverse section.

FIG. 6.



Charts in use at Moorfields up to the year 1916.

What Chart II. was intended to represent it would be difficult to say; it was utilised either as a horizontal or a vertical section in the sagittal plane. If it be regarded as a horizontal section, the stump of the optic nerve should be shown to the nasal side and not at the posterior pole, necessitating also different charts for the right and left eye, while if it is to be taken as a vertical antero-posterior section the optic nerve should not appear at all. The measurements depicted are not the mean of the extreme diameters of the eyeball, as they should be, seeing that the sclerotic does not form a perfect sphere. The diagrams are more nearly correct for the male than for the female eyeball, but as the difference in the two sexes is slight this is a matter of no great importance, especially as the injuries with which the charts are concerned happen but rarely to the female sex.

More important even than the faults in the charts themselves was the method which was used to plot

on them the site of a foreign body as intra- or extra-ocular. The figures supplied by the radiologist were the three measurements of the site of the foreign body, vertically, horizontally, and posteriorly, in reference to the central point of the cornea. That such exact practitioners as ophthalmic surgeons should have been in the habit of using in combination only two at a time of the three measurements given is hardly to be believed. Yet so it was, and at a time when in military surgery large numbers of penetrating wounds of the eyeball were being met with, supplemented by those sustained by workers in arsenal and munition factories, I pointed out the grave error we were making. The following is a quotation from my paper [1]:—

"Let us suppose from the X ray examination that the foreign body is 7 mm. below, 5 mm. to the temporal side of and 9 mm. posterior to the centre of the cornea. On Chart I., ruled to scale in millimetre squares, we count 7 mm. downwards from the corneal centre A and reach the point B; we then count from B 5 mm. to the temporal side and reach the point C [Fig. 7]. As far as this diagram is concerned we conclude that the foreign body is intra-ocular, but it must also be within the limits of the globe, as outlined in the antero-posterior section, before the point is finally settled. We proceed to determine its position on Chart II., and again we count 7 mm. vertically downwards from the anterior pole reaching the point B, and then 9 mm. horizontally backwards and we arrive at C', and again find that the foreign body is located within the confines of the eyeball. I am assuming that Chart II. represents a vertical antero-posterior section, as it is usually taken to do.

"Now it is obvious that C' cannot be the true position of the foreign body, for we are representing it on a mid-line section, and we know that it lies 5 mm. to the temporal side of this section. Moreover, to determine the relative position of two points in space involves the use of three co-ordinates, and though supplied with the three required we are using but two of them at a time.

"Wherein then do we go wrong? Making use of our charts again, what we have to do after marking out A B, 7 mm. and BC 5 mm., is to draw the line AC, and determine its length. ABC being a right-angled triangle, this is an easy

FIG. 7.

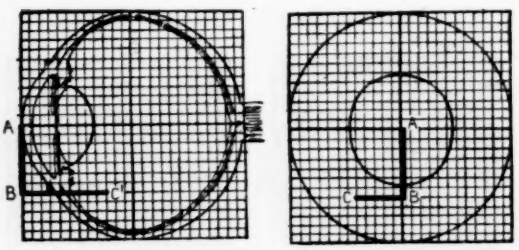


Chart II Chart I

Illustrating incorrect method of using charts for plotting a foreign body.

proposition to solve, for $AC^2=AB^2+BC^2$., i.e., $AC^2=49+25=74$, and $AC=\sqrt{74}=8{\cdot}6$ mm. approximately. Now Chart II. is to be taken as an antero-posterior section of the eyeball, through its poles but cut in the oblique plane AC, and on it from the central point of the cornea we have to count down not 7 mm. and find the point B, but 8·6 mm. when we reach the point C; from this point we count backwards 9 mm. and if the spot arrived at, D, is within the limits of the globe, as outlined in the diagram [Fig. 8], the foreign body is truly intra-ocular. It will obviously appear in the chart whether intra- or extra-ocular, for the chart represents a section in the plane in which the foreign body lies.

"It is easy to show that we may arrive at a conclusion which might be disastrous to a patient, unless we do our work correctly.

"Let us revert to our previous example with this single difference—viz., that we will now assume the foreign body is reported to be 4·5 mm. posterior to the central point of the cornea, instead of 9 mm., the other measurements being 7 mm. downwards and 5 mm. to the temporal side, as before.

"If, using Chart II. incorrectly in the way in which it has hitherto been employed, we count 7 mm. downwards and 4·5 mm. backwards we find the foreign body is located in the most dangerous part of the eyeball—namely, the ciliary body—but if, using our charts correctly, we regard the antero-posterior section (Chart II.) as one cut on the oblique plane AC and count, as we should, 8·6 mm. downwards and 4·5 mm. backwards, we find the foreign body is lodged harmlessly

FIG. 8.

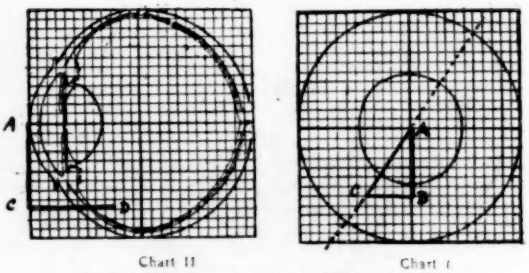


Chart II Chart I

Illustrating correct method of using charts.

on the surface of the sclerotic, over the posterior part of the ciliary body, and is really extra-ocular."

To avoid the use of arithmetic and facilitate calculation, new and more accurate charts are now in use (Fig. 9). On the "en face" chart are ruled circles centred on the central point of the cornea and of radii 1, 2, &c., up to 12 mm. The length of the line AC is by this means automatically determined by these circles, and the correct site of the located foreign body is readily and accurately plotted. It appears to me that Gonin's very ingenious method for deciding, on the eyeball, the diameter on which an observed hole in the retina lies, might well be used in dealing with intra-ocular foreign bodies situated in the vitreous chamber. With this addition to our radiographic measurements and charts, our hopes for the successful removal of non-magnetic foreign bodies through scleral incision should be decidedly improved.

Correct plotting of the position of a foreign body in relation to the central point of the cornea is well illustrated by the following case.

CASE 6.—Captain X sustained an injury to his left eye by a pellet of No. 6 shot on Oct. 6th, 1917. I saw him eight hours after the accident. There was considerable subconjunctival ecchymosis. The pellet had produced a dent in the sclerotic on the outer side behind the ciliary region, but the tension of the eye was normal and no vitreous was exuding. With the ophthalmoscope, after use of a mydriatic, no track of any foreign body could be seen in the vitreous, which was free of haze and of hæmorrhage, but the retina was almost everywhere grey from concussion œdema. This œdema had diminished two days later, but was still present at the centre and to the outer side. One or two spots of hæmorrhage were now visible in front of the retina and extending far forwards into the lower part of the vitreous. Radiographic examination revealed a pellet in the position indicated by the accompanying charts (Fig. 10), which showed the foreign body to be extra-ocular. Had the same measurements been employed as formerly the inference would have been that it lay within the eyeball. As a matter of fact, though the sclerotic had been struck, it had not been penetrated by the pellet, which indeed I removed from the orbital tissues. The intra-ocular changes had been produced by concussion. The hæmorrhage gradually absorbed; the retinal œdema resulted in the formation of some yellowish-white dots arranged in an arc outside the yellow spot region, and these were still present when I examined the eye some six or seven years later. In the lower periphery near the site of impact some slight pigmented changes in choroid and retina were also permanent. There was never any displacement of retina, and the direct vision of the eye, corrected for its myopia, recovered to 6/9.

TRAUMATIC TUMOURS OF THE IRIS.

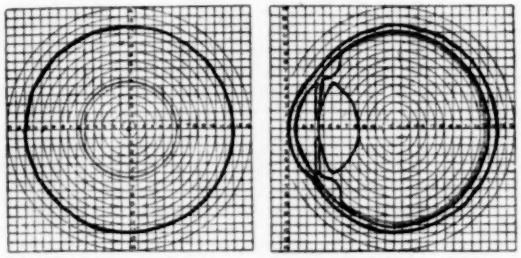
I come now to a rather infrequent sequela of a penetrating injury—namely, the formation of a cyst in the aqueous chamber.

CASE 7.—On July 29th, 1912, I excised an iris prolapsed through a wound at the highest point of the limbus of the right eye. The injury had been inflicted by a missile,

[1] Ophthalmic Rev., 1916, xxxv., 175.

possibly a screw, thrown at a boy 17 years of age, a few hours before he was brought to me. A neat upward coloboma of the iris was the result of my operation, and vision was unimpaired. On July 10th, 1915, my patient was serving as an officer in France when the same eye gave trouble after receiving a further slight injury with a twig, and Sir William

FIG. 9.



Charts now employed at Moorfields.

Lister recognised a cyst of the iris. On August 26th, 1915, I punctured the delicate grey wall of a cyst of the iris lying at the bottom of the anterior chamber. The cyst was somewhat lobulated and its anterior wall was slightly pigmented. The cyst collapsed, but a month later it was obviously re-forming, and on Oct. 27th, 1915, I made a section downwards with a Graefe's cataract knife, punctured the cyst in doing so, and performed a small iridectomy downwards, through both anterior and posterior laminæ of the iris tissue. Five weeks later I had to deal with a small knuckle of iris pillar prolapsed through the section; I removed the knuckle and covered its site with a flap of ocular conjunctiva.

The eye did well, but was now the subject of a double keyhole pupil. Though it was highly astigmatic from distortion of the corneal curvature, it could read 6/6 with the help of the appropriate cylinder lens. In this condition it remained permanently; the patient resumed his active war service, and was last seen by me in 1924. At this date a residue of the cyst wall remained and presented the appearance of a bracket at the bottom of the anterior chamber; the temporal horn of the bracket showed definitely some pigmented iris tissue. The nasal horn consisted of a remnant of the grey cyst wall and was devoid of any uveal pigment.

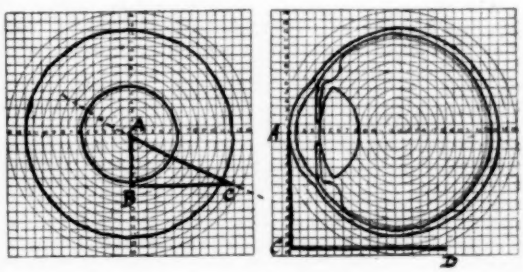
Traumatic tumours of the iris arising from implantation of epithelial cells are of two kinds. If corneal epithelium is carried into the iris the implanted epithelium proliferates, the central cells of the tumour—at first solid—degenerate, and a cyst is formed, the wall of which consists of stratified epithelium. The fluid contents are either serous or slightly turbid, and the iris membrane is often split by the cyst into two layers, of which the anterior is usually thinner than the posterior. Cysts of similar origin and construction have been described in the cornea. Another form of implantation tumour of the iris is the solid epithelial pearl tumour. This consists of epithelial cells, together with fat, sebaceous matter, and cholesterin crystals; the contents in time may become somewhat liquefied. This form of tumour arises from an eyelash, or from the cells of the root sheath of an eyelash which have been implanted in the iris tissue by the perforation. It seems unlikely that the cyst in the case I have just narrated belonged to either of these two classes. Remnants of implanted cells were certainly left behind by me in the iris tissue, and had these cells been epithelial further proliferation should have taken place. This did not occur, and I conclude that my case belonged to a third class of iris cyst—namely, the anterior chamber cyst with endothelial cell wall. Cysts of this class present clinically much the same appearance as the epithelial implantation cysts; their walls are transparent and their contents clear fluid. They are attributed to obstruction in the mouth of a crypt in the iris membrane, whereby lymph is retained, and they have been repeatedly observed to form after a penetrating injury, though they may occur without any trauma. It has been suggested that endothelial cells are carried in from the back of Descemet's membrane and may possibly play a part in the cyst formation in the cases preceded by penetrating injury. This form of cyst, a retention cyst, is likely to be permanently cured by simple puncture or generous excision of its wall, as happened in the case I have reported.

It will be seen, therefore, that when an eyelash has been carried into the anterior chamber by injury—and is seen lying upon the iris, it is important to remove it. This is a remarkable but not a very rare occurrence. To remove a lash from this situation is not always quite as easy as would be imagined. Attempts to grasp it with a forceps introduced after a keratome section usually result in the iris bellying up, so that this membrane is seized simultaneously with the lash in the branches of the forceps. I have found it simpler to pass a curette, with its groove directed anteriorly, over the iris and behind the lash, through a suitably placed section. A flexible Tyrell's blunt hook can then be guided in the groove of the curette behind the lash. The lash, macerated and pliable, can readily be engaged at its middle by the hook and withdrawn from the anterior chamber doubled upon itself; the difficulty which the iris membrane otherwise offers is thus readily overcome.

Siderosis.

The degenerative changes which occur in an eyeball in which an iron fragment has been retained over a long period are known as siderosis and result in degeneration of the eye. An iron-containing pigment is deposited in the tissues and particularly in the retina, pars ciliaris and pars iridis retinæ and in relation to the lens capsule. Much argument has waged as to whether this pigment is derived from the retained foreign particle or is of hæmatogenous origin. Widespread green staining appears in the tissues of an eyeball which has harboured a particle of copper, a metal which, by the chemical changes which it will undergo, is universally recognised as

FIG. 10.



Illustrating site of foreign body in Case 6 plotted correctly on improved chart.

most destructive when it is retained within the eye. Such green pigment is certainly not hæmatogenous, and comparison of the two conditions leads to the inevitable conclusion that in siderosis the iron-containing pigment is derived not from the blood but from the retained foreign body.

A TRANSPARENT LIVING LABORATORY.

The development in eyes of implantation growths, solid and cystic, is a reminder that the pathological processes with which the ophthalmic surgeon has to deal are identical in origin with those experienced in other parts of the body; in every structure the result will be modified by and adapted to the soil in which the process develops, but in the eye alone can the development be viewed directly by the observer.

I have with the ophthalmoscope watched a patch of solitary tubercle manifest itself in the choroid, and absorb and resolve into a scar under the influence of tuberculin injections. In the eye we may watch

syphilitic processes develop and subside under treatment. Inflammatory processes from direct or indirect microbic implantations or from great varieties of toxæmia come under our notice. Gas gangrene occasionally proceeds under our eyes. Pathological processes produced by organic and inorganic poisons are well known to the ophthalmic surgeon. Blood and vascular disorders are watched in the retina, which is only a detached portion of brain tissue. The organisation of fibrous tissue in relation to blood-clots can be observed in progress. Slit-lamp observation has added to the resources which the ophthalmoscope supplies. We frequently have opportunities to study primary malignant growths, both of epiblastic embryonic cells in connexion with the retina and of mesoblastic cells with the choroid, while secondary metastatic deposits are not uncommon.

The eye is a transparent living laboratory in which more work, both experimental and clinical, might perhaps be done by the research worker and the expert pathologist. In no other tissue of the body can we so closely relate the post-mortem finding to the observed living process. The tendency of the age is towards scientific medicine. How much of this is real scientia? Does it not tend to grow top-heavy, based too much on hypothesis? How much do we see accepted and discarded by our profession in a single life-time? Hypothesis is a necessary aid in prosecuting research, but, until proved to be fact, is no sure foundation for the practice of medicine and surgery.

PARAPHARYNGEAL ABSCESS.

THE QUINSY THAT ISN'T.

BY E. WATSON-WILLIAMS, *M.C.*, CH.M., F.R.C.S. EDIN.,

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To many medical men has probably fallen the humiliating experience of incising a "quinsy" and entirely failing to locate the pus; and this even where the history, symptoms, and fever have made the operator confident that "it was ripe," though perhaps the local appearances have been somewhat anomalous. As a rule, within a few hours or at most a few days the abscess is spontaneously evacuated. A closely similar occurrence is the bursting of a "quinsy" that the medical attendant has just assured the patient is not ready for incision. In both cases the volume of pus makes the error somewhat puzzling, and it is perhaps significant that the patient usually says, "it burst in the throat." The explanation, I venture to suggest, is in many cases that the abscess is not a true peritonsillar collection at all—that is, situated between the capsule of the tonsil and the sinus tonsillaris—but lies posteriorly in the lateral wall of the pharynx. Such an abscess is sometimes described as "peritonsillar but behind (or external to) the tonsil" instead of in the customary position above it. Though unusual, true peritonsillar abscesses are found in these situations. But the condition now under discussion is a suppuration in the bucco-pharyngeal aponeurosis behind the palato-pharyngeus muscle and posterior faucial pillar. It tends to point in the pharynx about the level of the lower pole of the tonsil, in the potential gap between the palato-pharyngeus muscle in front, the lower border of the superior constrictor above, and the stylo-hyoid ligament (with the middle constrictor) behind. These relations can generally be made out at operation: cases such as (1) and (3), where the tonsil was removed, demonstrate that the abscess is not peritonsillar. I have twice been able to verify the position of the opening in cases of spontaneous evacuation. This condition has clinical features that distinguish it from peritonsillar abscess. It deserves to be classified as a separate entity, if only because a special line of treatment is required, and I prefer to describe it as parapharyngeal.

Clinical Features.

The age and sex of my patients since 1925 were:—

M. 13 (d), 20, 23, 28, 36 (d).
F. 25, 26, 30, 32, 32, 35, 45 (t).

Five of the patients gave histories of previous quinsies, for which one had had the tonsils removed. In two more the abscess followed dental extraction without tonsillitis (d. d.) and in another (t) it resulted from a vigorous but vain probang search for a fish-bone.

In a typical case the onset closely resembles that of quinsy. The patient, a young adult, often "subject to tonsillitis," has an acute sore-throat. Instead of resolving, this persists, with unilateral pain, dysphagia, difficulty in opening the mouth, and swelling deep in the neck between the angle of the jaw and the hyoid. The temperature ranges to 100° or 102° F., the breath is foul, and the tongue coated, and there is constipation. In a severe attack the patient may be much distressed.

On examining the throat (not always an easy task) the tonsil of the affected side is seen to be pushed inwards and often apparently enlarged. The striking feature is the absence of œdema of the mucosa of the soft palate and uvula; this œdema is a constant accompaniment of a true peritonsillar abscess, except in the very first hours, and often suffices to hide the tonsil, even when this is swollen and pushed inward. Closer inspection in parapharyngeal abscess shows that the tonsil is conspicuous, both on account of its displacement and because it is rotated forward so that we see the inner surface. If the attack began with tonsillitis there may be traces of this remaining, but neither anterior faucial pillar nor uvula is appreciably swollen. The posterior pillar is displaced inward more than the tonsil itself, and behind it the lateral pharyngeal wall bulges so that the recess is obliterated. In *this* region the mucosa appears œdematous, particularly if the tongue is well depressed to give a low view. The tonsil is usually not even tender on pressure, but the posterior swelling is boggy and often exquisitely sensitive; low down in it an area of pointing may be palpable.

Corresponding with the absence of palatal œdema, the voice has not the muffled tone so typical of quinsy. The cervical swelling tends to be more considerable than is usual with quinsy and is often rather a deep boggy infiltration than an adenitis, though the latter may coexist; the area tender to deep pressure is more extensive than we should expect. The dysphagia also is apt to be more severe than with quinsy, where only the worst cases are completely unable to swallow. Here this symptom is not uncommon, and seems out of proportion to the throat appearances. The patient may have to lie on one side to avoid constant disturbance from saliva overflowing into the trachea. When by an effort he can swallow fluids, he soon finds that *c'est le premier pas qui coûte*—the first gulp is the painful one. An occasional "long drink" is consequently much preferred to frequent sips.

In addition to pain on swallowing there may be constant aching in the side of the throat and neck. It does not as a rule radiate to the ear, as with quinsy, but may be sufficiently intense to need full doses of opium. Difficulty in opening the mouth is not due to trismus but to the neck infiltration and the pain of muscular activity; the patient may be able to open the mouth with the hand when he cannot in the ordinary way. Pain of all sorts tends to diminish as the abscess begins to point. In those cases where I have been able to secure pathological examination of the pus a streptococcal infection has been reported.

Diagnosis and Course.

Diagnosis rests on the manifest signs of suppuration in the region indicated, and differentiation from a true peritonsillar abscess on the features just enumerated, especially the absence of palatal œdema. With a tonsillar or with a true post-peritonsillar abscess there is a recess behind the posterior faucial

pillar, though this may be difficult to determine until the patient is anæsthetised. Retropharyngeal abscess is rare after the fourth year; it lies behind the pharynx, though usually not in the mid-line, and cervical adenitis is not a conspicuous feature. The signs of suppuration should prevent confusion with a gumma or neoplasm, though many sarcomata of the tonsil have been incised in error.

The abscess tends to point in the pharynx and in many cases ruptures spontaneously. Unless relieved by nature or art, suppuration may extend into the deep cervical planes with disastrous results. Septicæmia, mediastinitis, jugular thrombosis, and even erosion of the internal carotid artery* have all been recorded in circumstances that leave no doubt that an abscess of this type was involved. In my own series there have been no serious sequelæ, but all these cases opened or were opened into the pharynx. Laryngeal œdema probably need not be feared, though it is in the post-peritonsillar type that it is apt to occur.

Treatment.

In view of the grave possibilities the abscess should be opened as soon as the surgeon feels there is pus present. A general anæsthetic is necessary, and for this nothing is so suitable as ether given by the open drop method. Before the anæsthetic is started a gag (e.g., Sydenham's) should be placed between the patient's teeth, or at least a "mouth-opener"; Killian's "long speculum for median rhinoscopy" is excellent. As with all such operations, a tracheotomy set should be ready. For those who like it, an aspiration pump may be useful. The patient should be arranged so that the head can be readily and rapidly lowered in case the abscess ruptures during induction. With the head fully extended, so that the vertex is downward, the mouth is well opened. The swelling is palpated and as a rule an area of pointing can be made out as described; the abscess is then opened in that area, or, if it is not felt, at the spot mentioned—viz., immediately behind the posterior faucial pillar at the level of the lower end of the tonsil, directly outwards or a trifle forwards. For opening the abscess only a really blunt instrument is permissible. I generally use a very blunt tracheal dilator; when closed it readily penetrates the softened mucosa and can then be opened in a longitudinal direction to give free exit to the pus. Once when this was not available a tongue depressor served perfectly, and on three occasions the gloved finger-tip has sufficed. A really blunt instrument can be passed outward without fear if pus is not struck at once, as it generally is; a narrow or sharp instrument could not be used thus.

After-treatment presents no special features. The patient may find a difficulty in opening the mouth properly for some days or even weeks, owing to the infiltration of the muscles, especially, it would seem, the digastric; he should be encouraged to exercise this function often, stretching the mouth to maximum gape two or three times in succession several times a day.

Where the abscess is not opened by the manœuvre described it must be approached from without. An incision along the anterior border of the sterno-mastoid will give excellent access. The digastric muscle being retracted backward, the area is approached a short distance above the hyoid bone and behind the margin of the hyoglossus. The operator should be prepared to deal with bleeding from the large vessels, which are sometimes exposed in the abscess cavity, but the line of approach just indicated lies far enough in front to avoid creating trouble that is not already present.

Case Reports.

CASE 1.—A man of 20. His medical attendant told me that tonsillitis had started 16 days before. On the eighth day, feeling certain that there was a peritonsillar abscess, he had incised the palate above the right tonsil and had explored the tissues with Sir StClair Thomson's quinsy forceps, but without result. He had waited in daily expectation of spontaneous opening until the fifth day from then (thirteenth day of the disease). Difficulty in swallowing and in opening the mouth had become severe, and he made a second incision and exploration but with no greater success; both operations had been done under general anæsthesia. On examination, which was considerably hampered by pain in opening the mouth, the tonsil was seen not to be swollen, but to be pushed forward by a large swelling of the lateral pharyngeal wall. There was no œdema of the soft palate or uvula and the incision was healing; but a deep cervical infiltration present for some days was now conspicuous and brawny. Under general anæsthesia the tonsil was dissected out very easily, but without revealing the abscess. The pharyngeal swelling was palpated, and behind where the lower pole of the tonsil had been the examining finger passed easily through an aperture in the submucous tissues, tearing the mucosa and evacuating a large and very offensive abscess. Two days later all symptoms had disappeared, except difficulty in opening the mouth, which persisted for a month.

CASE 2.—A woman of 34 came complaining of a sore-throat for four days with some difficulty in swallowing. She had once before had a quinsy. On examination I found the right tonsil pushed forward and inward, not swollen; there was no œdema of the mucosa of soft palate or uvula, but there was an obvious bulging of the lateral pharyngeal wall immediately behind the tonsil. A tender, ill-defined swelling could be felt deep in the neck behind the angle of the jaw; the temperature was 100° F. Treatment was by salicylates and external heat. Three days later the pharyngeal swelling was still more prominent, but did not involve the posterior wall; there was no palatal œdema. The cervical swelling was larger and firm, with considerable dysphagia and difficulty in opening the mouth; the temperature was 102·2° F. Under general anæsthesia the pharyngeal swelling was palpated, and an area found rather low down—i.e., distinctly further down than the lower pole of the tonsil—where instead of the general rather boggy firmness there was a palpable gap in the submucous tissues. A blunt tracheal dilator passed into this with very little pressure, and on opening it half an ounce of rather offensive pus was liberated. Recovery took place in five days.

CASE 3.—A woman of 30 had had several quinsies, and about two years ago I dissected out the tonsils. Nine months later she came to me with the story that she had got another quinsy; there had been pain in the right side of the throat for three days, with great dysphagia and difficulty in opening the mouth. There was no trace of tonsil, but behind the right posterior faucial pillar a large swelling was visible, pushing in the pharyngeal wall; the deep tissues of the neck were tender but not manifestly swollen; the temperature was 100° F. Shortly before operation, early next morning the abscess burst "into the throat," discharging a quantity of very offensive pus and bringing instant relief.

CASE 4.—A boy of 13 came complaining of pain in the left side of the throat and the left ear for six days; there had never been any previous trouble in either. Eight days before the onset a right upper molar had been removed but no abscess had been found under it. There was great difficulty in opening the mouth, and some dysphagia; the temperature was 102° F. On examination the left tonsil was seen to be pushed forward and also rotated forward by a swelling in the lateral wall of the pharynx behind the posterior pillar; the swelling caused some protrusion of the palate above the tonsil, but there was no œdema of the mucous membrane. Between the angle of the jaw and the hyoid a deep and tender swelling was found, apparently adenitis with much peri-adenitis. Under general anæsthesia the pharyngeal swelling was palpated, but no area of softening was discovered. Gentle pressure with a blunt tracheal dilator in the usual site produced a gush of offensive pus. Two days later all symptoms had disappeared and the tonsil looked normal.

CASE 5.—A woman of 26 came complaining of sore-throat for eight days, at first bilateral, but during the last two days on the left side only, much more painful, and accompanied by swelling in the neck. For one day she had been unable to swallow anything. Four years before she had had a quinsy. On attempting examination it was almost impossible to open the mouth. When this was achieved, the left tonsil was seen to be red, conspicuous, and pushed forward and inward; there was no œdema of the palate. Below and behind the angle of the jaw was a deep, hard, and tender infiltration. The temperature was 100·4° F. Under anæsthesia the same evening the mouth was properly opened and a prominence of the pharyngeal wall immediately behind the tonsil was palpated. A "gap" was felt level with the lower border of the latter and the gloved finger-tip passed easily through the mucous membrane at this point, liberating about one ounce of very foul pus. Two days later all general symptoms had disappeared, and a week after the operation she was perfectly well.

CASE 6.—A married woman of 32 complained of sore-throat for six days, with some difficulty in swallowing. There

* Mayer, O.: Wien. klin. Woch., April, 1926, p. 508; Negus, V. E.: Proc. Roy. Soc. Med. (Sect. Laryngology), 1929, xxx., p. 516.

was some enlargement of the glands on both sides behind the angle of the jaw, and on the left the swelling was great, ill-defined, and very tender. The left tonsil was swollen and pushed forward by a swelling behind it, but there was no palatal œdema. Next day under general anæsthesia the swelling was palpated and found to be in the lateral wall of the pharynx; behind the tonsil was an area of softening and the gloved finger-tip opened an abscess. In six days she was perfectly well.

The following case was not under my care, but I had exceptional opportunities of observing symptoms and progress.

CASE 7.—A medical man, aged 36, had had the left lower wisdom tooth removed three weeks earlier for caries; there had been no abscess. The pain was not relieved but got steadily worse, and was felt behind rather than in the jaw. For three days he was unable to swallow saliva, and for one day could swallow nothing at all, nor could the teeth be separated except with the hand; sleep was obtained only with large doses of morphine. He sought a surgical colleague and asked him to open the abscess which, from his sensations, especially on movement, he located "deep to the hyoglossus at its posterior border." Incisions were made in the mouth along both sides of the jaw and the tooth socket was curetted, but without finding pus. Some relief followed, though opening the mouth remained difficult, but high temperature persisted and he looked and felt very ill. A consultation was held, at which the diagnosis of peritonsillar abscess was suggested, but he declined to accept this; the tonsil was not swollen or tender, there was no palatal œdema, and a swelling could be felt in the pharyngeal wall below and behind the tonsil. Six days after the operation he felt a tickling in the throat, and a large abscess opened rather gradually; the pus coughed up literally "stank the house out!" The opening of the abscess was discernible later, rather low down in the lateral wall of the pharynx. Though all other symptoms rapidly subsided, five weeks elapsed before he could open the mouth in the normal manner.

Summary.

(1) Parapharyngeal abscess resembles in its clinical features peritonsillar abscess; the most striking difference is the absence in the former of œdema of the palatal mucosa.

(2) The condition should be suspected when a "quinsy" appears to run an anomalous course, or when incision in the usual site above the tonsil fails to locate pus.

(3) The abscess tends to point low in the side of the pharynx behind the posterior faucial pillar; it is easily opened here by slight pressure with a blunt instrument, which alone is permissible.

A STUDY OF THE ANTIRACHITIC VALUE OF IRRADIATED YEAST.

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As yeast is the richest known source of ergosterol a study of the extent of its usefulness after activation by ultra-violet rays deserves attention. As far as we are aware, A. F. Hess [1] was the first to test the antirachitic potency of irradiated yeast. He administered daily to rachitic infants "from 0·5 to 1 g. doses, suspended in milk. This preparation was readily taken and brought about . . . a definite curative process." The yeast was also tested on rachitic rats and caused calcification of the epiphyses when from 10 to 25 mg. were given daily. Smaller amounts were not tested. Though these preliminary observations were highly encouraging, the therapeutic possibilities of irradiated yeast have not since been given much attention. Kirsch, in 1928,[2] described experiments on rats wherein good results were obtained; he used, however, very massive doses, from 0·5 to 1 g. per rat daily. Wachtel [3] recently published a paper on "the increase and vitamin enrichment of mother's milk and cow's milk by means of irradiated yeast." It is stated there that "cenomilchquell," probably a commercial preparation, the composition of which is not given, "containing irradiated yeast as the most important and predominant component," is extremely effective in promoting the milk-flow of lactating mothers. The administration of irradiated yeast (amount not stated) to milch cows is said to have a very favourable effect on the quantity of the milk produced and its antirachitic value. Clinical results are not given but, according to Wachtel, the "yeast-milk" will be given a practical test this winter in a pædiatric clinic.

One of us (S. K. K.) was interested for some time in the problem of ultra-violet activation of yeast and, during a visit to the United States a year ago, had the opportunity of discussing with Dr. Hess the therapeutic possibilities of such irradiated yeast. He was encouraged by the latter to try the yeast in Poland. This was mentioned by Dr. Hess in a recent paper [4] and, though the conditions in our country with regard both to the severity of rickets and to the economic situation are not so hard as pictured by him, yet the cost of treatment will without doubt be of the utmost importance in deciding the issue of any large-scale antirachitic action in Poland. Reliability, low price, and ease of preparation are essential if an antirachitic product is to gain access to those classes of the population where rickets is common. Irradiated yeast seems to fulfil these requirements to a remarkable degree. According to Hess,[5] "there may well be a field for this preparation, especially where the matter of expense is of primary importance. Activated yeast can be prepared at low cost and is sufficiently potent for all therapeutic purposes."

The present communication is the result of a coöperative investigation started by the State Institute of Hygiene in Warsaw in order to gather reliable experimental information on the practical value of this and other antirachitic preparations. It is of a preliminary nature, firstly because of the limited experimental data presented, and, secondly, because it covers only a small part of our scheme and leaves many important problems pertaining to irradiated yeast untouched. As we believe, however, that the results obtained are so far conclusive and reasonably accurate, we deem it advisable to publish this account.

Experimental Method.

Pure baker's yeast was used. It was always purchased fresh directly from the same reliable factory, brought immediately to the laboratory, and spread on paper until air-dry. It was then ground in a laboratory mill, and then in a ball-mill to an impalpable powder, and stored at room temperature in glass-stoppered jars. For activation the yeast was spread by means of a sieve in thin layers (50 g. on an area of 52 by 34 cm.) on metal trays and exposed to the radiations of a Hanan quartz mercury-vapour lamp (180 v. 7·5 a.) for 30 minutes. At the end of 15 minutes the layer of yeast was resifted, in order to expose a fresh surface to the action of the rays. No effort was made to exclude oxygen. After irradiation, 0·75 g. portions of the yeast were weighed out and sent to the children's home for testing.

The experiments were carried out on a group of 12 rachitic children, inmates of the municipal home, ranging in age from 4 months to 2½ years. Six of them were given irradiated yeast, three controls the same amount of non-irradiated yeast, while three other controls were kept on the institutional diet without any addition. In the course of the investigation all these children were kept under uniform conditions, partaking, according to age, of the diets usually employed in this institution. The experimental results are given in the Tables. The yeast was

TABLE I.—*Effect of Irradiated Yeast on Infantile Rickets.*

—	Date.	M.Z.	R.F.	Wan.	A.A.	P.I.	Mu.
Age (mths.).	—	6	6	7	5	6	6
Weight (kg.).	—	4·5	4·7	5·9	4·0	3·8	5·1
Serum calcium mg. per 100 c.cm.	1/12/29	10·0	10·2	10·7	—	10·4	10·1
	11/12/29	10·4	10·5	10·0	—	10·0	11·0
	21/12/29	10·6	10·6	10·9	10·6	—	10·9
	5/ 1/30	10·4	10·4	10·8	9·5	9·9	10·1
	20/ 1/30	10·9	10·8	11·1	11·0	10·5	11·2
Serum phosphorus mg. per 100 c.cm.	30/10/29	2·78	2·67	3·20	3·53	4·50	4·03
	20/11/29	2·86	2·98	3·33	3·54	3·67	4·12
	1/12/29	5·30	4·27	4·85	5·45	6·00	6·97
	11/12/29	7·57	6·87	5·14	7·12	6·50	6·71
	21/12/29	6·35	6·05	6·33	6·38	—	5·92
	5/ 1/30	7·31	5·42	6·00	5·55	5·36	6·00
	20/ 1/30	5·86	6·34	6·38	7·50	5·77	7·14
Craniotabes.	20/10/29	+	±	±	+	±	±
	3/12/29	+	+ +	±	±	+	+
	20/12/29	—	+	—	—	—	—
	16/ 1/30	+	±	—	—	—	—
	21/ 1/30	—	—	—	—	—	—
Radiograms.	6/11/29	Mild rick.	Def. rick.	Def. rick.	Def. rick.	Osteop.	Normal
	24/11/29	Worse.	Worse.	Worse.	Much worse.	Rick.; osteop.	Mild rick.
	25/12/29	Heal.	Heal.	Adv. heal.	Adv. heal.	Heal.	Normal.
	11/ 1/30	Almost comp. heal.	Adv. heal.	Comp. heal.	Comp. heal.	Healed.*	,,
Remarks.	—	Whooping-cough in Jan.	Bronchial asthma in Dec.	—	—	Had diphth. of nose and otitis media.	—

Rick. = rickets; def. = definite; adv. = advanced; comp. = complete; heal. = healing; osteop. = osteoporosis.
* Slight deformity of epiphyses.

administered once daily suspended in the milk mixture, and was readily taken. There were no gastro-intestinal disorders. The administration of the yeast was continued even in the presence of intercurrent illness associated with fever.

Calcification of the cranial bones was generally the first clinical sign of improvement, craniotabes disappearing in the course of two to four weeks. This was followed by an increase of muscular tonus. Radiologically, advanced healing could be noticed in the course of one month, while serum phosphorus (estimated by the Briggs-Bell-Doisy method) increased markedly within ten days. After about one month a difference in behaviour and activity between the two sets of children became quite noticeable, the soft-muscled, flabby, untreated babies contrasting with he playful, energetically kicking treated ones. The rapid rise of the serum phosphorus in the group receiving the irradiated yeast is noteworthy. In a few cases the phosphorus reached a rather high level,

TABLE II.

—	Date.	Untreated controls.			Controls receiving non-irradiated yeast.		
		Rom.	L.L.	Ron.	Wa.	Pa.	Az.
Age (mths.).	—	8	7	5	30	4	5
Weight (kg.).	—	5·0	6·0	4·4	11·0	5·0	3·6
Serum calcium mg. per 100 c.cm.	1/12/29	8·2	10·0	—	—	—	—
	8/12/29	—	—	—	—	10·0	7·5
	11/12/29	8·0	8·2	—	—	—	—
	18/12/29	—	—	—	10·2	9·4	8·0
	21/12/29	7·2	10·0	—	—	—	—
	5/ 1/30	7·5	—	—	—	—	—
	10/ 1/30	—	—	—	11·2	—	8·0
	20/ 1/30	6·7	9·0	10·8	—	—	7·4
Serum phosphorus mg. per 100 c.cm.	30/10/29	3·46	3·00	4·50	—	—	—
	20/11/29	3·88	4·01	5·00	—	—	—
	26/11/29	—	—	—	3·71	3·83	4·18
	1/12/29	3·87	3·83	4·50	—	—	—
	8/12/29	—	—	—	3·30	3·82	4·45
	11/12/29	4·39	3·78	4·41	—	—	—
	18/12/29	—	—	—	3·11	3·10	4·50
	21/12/29	4·15	3·14	3·91	—	—	—
	28/12/29	—	—	—	2·90	3·64	4·18
	5/ 1/30	3·40	3·09	3·12	—	—	—
	10/ 1/30	—	—	—	3·27	3·46	4·14
	20/ 1/30	3·70	3·00	3·68	—	3·52	3·65
Craniotabes.	20/11/29	+	+	+		+	
	3/12/29	+	+	+			
	20/12/29	+	+	+ +		+ +	+
	16/ 1/30	+	+	+ + +		+ + +	+
Radiograms.	6/11/29	Rick.	Rick.	Normal.	—	—	—
	24/11/29	,,	Worse.	Mild rick.	—	—	—
	1/12/29	—	—	—	Very sev. rick.; enlarged epiphyses; bow-legs; deformity of thorax.	Sl. rick.	Rick.
	25/12/29	Def. rick.	Sev. rick.	Worse.	—	—	—
	31/12/29	—	—	—		Def. rick.	—
	11/ 1/30	Def. rick.	Sev. rick.	Sev. rick.	—	—	—
	15/ 1/30	—	—	—	Heal.*	Worse.	Def. rick.

* Transferred to irradiated yeast on Dec. 31st.

but no untoward symptoms whatever were associated with this rise. The serum calcium was regularly estimated (by the Clark-Collip modification of the Kramer-Tisdall method). It remained quite normal throughout the experiment in the group of treated infants, though it was low in some of the controls. Routine examination of the urine disclosed a perfectly normal picture. There are no noteworthy differences in the weight increments of the two sets of children. We did not notice the temporary growth stimulus reported by Hess after administration of autolysed or irradiated yeast to infants. Our dosage (0·75 g. daily) is based on the amounts given by Hess and also on a rough calculation of the possible activity of the yeast. It seems to be adequate. We are studying now the effects of higher and lower concentrations.

A commercial preparation of irradiated yeast has lately been widely advertised in America, the hope being expressed that with the addition of the antirachitic vitamin D this particular brand of yeast "will play an increasingly important part in the American dietary." We doubt whether the inclusion of such a potent preparation in the daily menu would be wise or advisable. The recent work on hypervitaminosis, and especially the important findings of Jundell,[6] should sound a serious warning against the indiscriminate use of irradiated preparations and foods by the general public. Antirachitic medication and prophylaxis must be left in the hands of physicians.

Summary.

The daily administration of 0·75 g. of irradiated yeast to rachitic infants brings about a disappearance of the symptoms in the course of six to eight weeks.

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THE MECHANISM OF A MEASLES EPIDEMIC.

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EVERY alternate year the educational and health authorities of London prepare to receive the attack of measles, destined to make about one hundred thousand children miserable, to say nothing of their parents, to kill more than a thousand of them, and to leave many more with health impaired for life. In facing this periodic attack there is brought into play a great deal of administrative machinery, without, it is to be feared, producing any sensible effect on the course of these epidemics, though certainly ameliorating their toll of mortality and crippling disease. It is a little puzzling that we are content to gaze upon this spectacle, which has been going on not only in London but in every large city for centuries, without troubling very much about its cause, whereas mathematicians readily devote their lives to working out with the utmost precision the causes which determine the periodic return of planets and comets, which do not seem to have any remarkable relation to our happiness, interesting though they are.

The solution of problems such as the causation of epidemics are left to a few underpaid and overworked research workers who have ideas as to how the problems might be solved but neither funds nor adequate assistance by which to even collect the available information. Much, indeed, of the desired information is found not to be available, since the notification records, secured at considerable public expense, are considered to have served their purpose when the necessary administrative action has been taken, and have been sent to the destructor. This is not surprising, because the medical officers in our public health services certainly have no time for prolonged and arduous researches into such matters. And so these epidemics come and go with monotonous regularity whilst every ten or twenty years some research worker in vital statistics finds time to take up the problem where a predecessor had been compelled to leave it, and advances matters one stage further towards the desired solution. Such is our English method of "muddling through."

Cause of Periodicity.

In a paper published in October, 1928,[1] I showed, from analysis of the records* of some 10,000 measles cases and their contacts in St. Pancras, that if immunity to measles can only be acquired by an attack of the disease, the periodic changes which actually occurred in the proportion of children not immune in that sense in the total population at different ages during the years 1924–28 were much too small in amplitude to account for the epidemic phenomena during those years.

In the upper portion of Fig. 1 (which is a modification of Figs. 4A, 4B, and 5 in the paper referred to) the fluctuations in the actual total numbers of children under 10 who had become insusceptible owing to a previous notified attack are shown. As an example of the amount of fluctuation which really occurs I may quote the conclusion that at the pre-school ages 2, 3, and 4 the 1926 epidemic brought down the percentage of children at risk from 86 to 76, at the infant school ages 5 and 6 from 71 to 61 per cent., and for all children under 10 from 74 to 67 per cent., or in actual populations from 26,500 to 24,000 out of 36,000 in all.[2] Allowance for the fact that all these figures are slightly too high, owing to 10 to 15 per cent. of cases probably escaping notification, does not appreciably affect the conclusion that the amplitude of these fluctuations, which has usually been assumed to be sufficient to account for the biennial periodicity of measles epipemics, in actual fact does not suffice to explain this. A rapid calculation from Fig. 4 leads to the conclusion that about 21 per cent. of all children of the school ages 5–13 would be at risk to measles at the start of an epidemic and about 18½ per cent. at the end of it.

If, however, we could suppose that, as for diphtheria, each measles case was accompanied by several latent cases but that the latent immunity so produced gradually disappeared after the epidemic, as Gill[3] has shown to occur in malaria, taking about two years instead of five years to disappear, then the amplitude of these immunity waves might be increased 3, 4, or 5 fold and we should have a most reasonable explanation, not only why the epidemic comes to an end but why it fails to occur in the next year when the seasonal conditions are favourable and there are plenty of children available who have not had the disease†

Suggestions of Latent Immunisation.

I was not aware that any previous suggestion of a latent immunisation in measles had been made when I produced evidence in favour of it in the paper referred to, but I find that as early as 1913 Butler, in a remarkably able paper on measles to the Epidemiological Section of the Royal Society of Medicine,[4] suggested, though he was not able to prove it, that "not age, per se, but the opportunity which it confers of acquiring an active immunity through exposure to attenuated or minor doses of infection brings about the changes in susceptibility

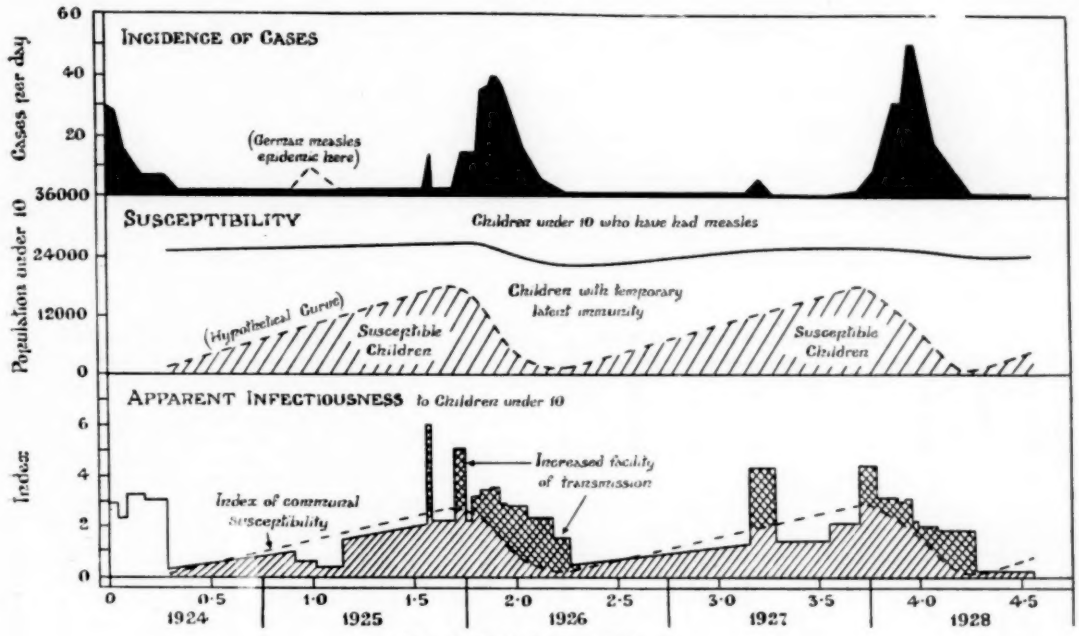
* Made available for research through the kind coöperation of the Medical Officer of Health, Dr. G. Sowden.

† According to the calculation in St. Pancras, in November, 1926, 51·6 per cent. of children aged 5 to 10 had not had measles as compared with 53·8 per cent. in December, 1925, when a large epidemic followed.

exhibited..." Dudley[5] called attention again to this statement of Butler's in a paper read to the same section a year ago, and pointed out the similarity between the Willesden curve of incidence amongst

show so well the rapid loss of congenital immunity during the first year. The maximal age in the St. Pancras curve is not attained until two years later than in the Willesden curve, but the maximum reached

FIG. 1.



Measles in St. Pancras, 1924–28.

contacts and the immunity curve in diphtheria according to the Schick test.

In Fig. 2 I have brought together on the same diagrams curves constructed (A) from Butler's series of histories of measles in Willesden school-children, and (B) from the St. Pancras notification data. The left hand portion of the figure shows the percentages of children who had at some time passed through a clinical attack at successive years of age up to ten and indicates a similar trend in both, but somewhat lower percentages throughout in St. Pancras, owing to notification being not quite complete, and Butler's data being restricted to public elementary school-children. The curve B (1) represents the condition of affairs at the start of the 1926 epidemic, B (2) a year later, and B (3) a year previously, when no epidemics followed, and the difference between these is clearly too small and inconstant to determine

is practically the same, about 90 per cent. To produce this effect on the curve and thus reduce the mortality has certainly been the aim of public health authorities in recent years, but much as I would like to attribute the difference to these efforts, it must be admitted that it may perhaps be due to other causes such as different housing conditions and degrees of over-crowding in the areas compared. A comparison of the B (4) and B (5) curves shows that in the second and third years of life the expectation for a child who has not had it of catching measles during an epidemic is increased six-fold if a case occurs in the same house, or at ages 4, 5, or 6 it is increased five-fold. The percentage attack-rates in the 1926 epidemic were as given in Table I.

The chance of infection among contacts living in the same house cannot be much affected by school attendance, at any rate up to the eighth year, since

TABLE I.

Age-group	0–	1–	2–	3–	4–	5–	6–	7–	8–	9–
Contacts at risk (B4)	59·0	75·5	73·1	80·5	88·4	91·9	82·1	75·3	61·4	56·2
All children at risk (B5).. ..	8·5	12·1	12·9	15·0	17·7	18·8	16·7	6·5	2·9	1·5
Ratio of B5 to B4	0·144	0·160	0·177	0·186	0·200	0·205	0·204	0·086	0·047	0·026

the occurrence or non-occurrence of epidemics in alternate years. The right hand portion of the figure compares (A) the attack-rates at each age in Willesden during 1908–11 among the children still at risk living in the same house as a case, with (B (4)) the same in St. Pancras during the 1926 epidemic, and at the foot we have (B (5)) the attack-rates during the same epidemic in the whole population at risk in St. Pancras. The apparent difference between the upper curves in the first year of life is merely due to Butler having subdivided this age-group into two halves, whilst my point represents the whole year, and does not

contacts are kept at home from school in any event, and the B (4) rates may therefore be taken as units for the measurement of immunity at each age, and the B (5) rates in all children at risk expressed in terms of these units should indicate how the expectation of catching measles from any source whatever changes with advancing life. It appears that this ratio increases up to age 4, as would be expected from the ever-increasing range of movement of the child, but strange to say it remains steady from 4 to 6, and then falls off, so the expected increase in risk at age 5 does not appear, and I think that

Butler was well justified in giving a hesitating support to his statement that "delaying the age of commencing attendance at school would probably raise to a higher age the proportional incidence of measles." In whooping-cough, in which disease, as I hope to show in a paper shortly to be published, latent immunisation seems to be absent or of little importance, the ratio of attack-rate in all susceptible children to attack-rate in susceptible home contacts increases from the second year of life to double its value by the fifth year, and continues to increase steadily afterwards, and I think there is no doubt that the different behaviour of the ratio in measles, ceasing as it does to increase by the fifth year and actually decreasing after the seventh, can only be explained by latent immunisation counteracting the effects of increasing mobility and risk of infection.

Having read rather hastily Halliday's admirable report on the incidence of measles in Glasgow tenements[6] published in 1928, just before my original paper went to press, I omitted to notice this interesting suggestion on page 18,

"in spite of the fact that in March the tenements still contained 49 children who had not had measles, only one further case of measles occurred. This fact may have been related to the chance of exposure. On the other hand, it suggests the possibility that during the progress of the main outbreak the presumably susceptible children who did not develop measles were exposed at intervals to small doses of the virus, and thus developed a degree of immunity. . . . In these circumstances, however, such an immunity would be temporary and partial, as the vast majority of individuals are destined sooner or later to undergo an attack of the disease. . . . . "

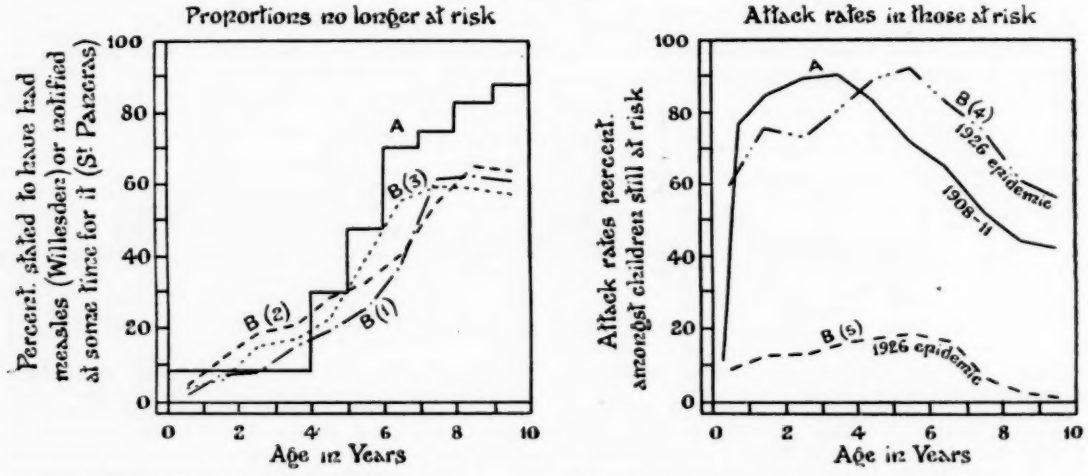
Apparent Infectiousness.

Here we had a suggestion of that *temporary* latent immunisation in measles for which I produced some statistical evidence, to be further amplified in the present communication. Briefly, the evidence for this so far obtained depends upon (*a*) the behaviour of the index of apparent infectiousness between epidemics, and (*b*) a study of the subsequent behaviour of children who were contacts to a case of measles in their homes as compared with that of control groups. The *index of apparent infectiousness* for measles is defined in this way. If n cases of measles occur in any period of time t, and s children under 10 develop the rash in the same house as, and after an interval of 10, 11, 12, or 13 days from the appearance of the rash in, one of the n cases, then the apparent infectiousness during period t is measured by the ratio $p=s/n$; and if q be the ratio during a post-epidemic period of low incidence, then the index of apparent infectiousness is p/q. That is to say, it is the chance of one case being followed by another in the same house under standard conditions of exposure, in terms of the chance, measured in the same way, during a quiet period following an epidemic.

From Fig. 1 it will be seen that, instead of remaining level or only rising with extreme slowness up to the moment when an epidemic is about to begin, as I find occurs in other infectious diseases, the index steadily rises during the whole of the non-epidemic year, culminating in a sudden additional increase at the start of the epidemic and then a rapid fall during the epidemic. The gradual rise has evidently no relation to season, and must represent an immunity change. This index being a product of what I have called the *index of communal susceptibility* (or relative proportion of the children under 10 in the population who remain susceptible at the middle of the period), on the one hand, and the *index of true infectiousness* (or relative danger *for a susceptible child* of catching the disease if exposed to a case under standard conditions during the period), I have shown by the dotted line and shaded portions what are probably the relative parts played by these two factors. The hypothetical curve of communal susceptibility is derived from the changes which occurred in the population of susceptible children under 10 on the assumption of a latent immunisation of about four children to each clinical case and a subsequent loss of that immunity at a rate, suggested by other evidence, which would cause it to disappear in about two and a half years. The portions of the index above the dotted curve are in that case attributable to increased facility of transmission of the virus from person to person, and this at first sight appears to remain enhanced throughout the epidemic, but, as I shall show presently, this is only because we are dealing with a large area and looking at a composite picture for the whole of St. Pancras, for when analysis into small areas of a quarter of a square mile is made, it is found that as the epidemic successively invades these squares the index rises violently in each, and then subsides to a low level within about six weeks.

In my original paper I was puzzled by the absence of any rise in the index during what appeared to be a small epidemic in 1925, and after pointing out

FIG. 2.



B (1) December, 1925, at start of epidemic.
B (2) November, 1926, no epidemic following.
B (3) November, 1924, " "
A } Amongst susceptible children in same house as a case.
B (4) }
B (5) In whole susceptible population.

Susceptibility to measles in London. A = Willesden elementary school-children (1911. Butler). B = St. Pancras total child population (1924–26).

that the age distribution of cases in this outbreak was different from that of the two major epidemics, I stated on p. 398, "during two minor outbreaks in pre-epidemic periods the apparent infectiousness was temporarily greatly enhanced, but in another extra epidemic which chiefly attacked older children this was not the case." Not having touched the notification data of German measles when I wrote that, I failed to perceive that this extra epidemic almost certainly consisted partly, perhaps entirely, of German measles cases wrongly diagnosed, for a large epidemic of that disease was occurring at that time, the next being in 1929. This little epidemic of measles notifications seemed to constitute an exception to the rule that the index of apparent infectiousness must rise for an epidemic to occur, but it now appears that it is just the exception which proves the rule. It will be seen from Table II. that the definition of 10–13 days inclusive as the most suitable interval between cases for calculating the index for measles brings in about one-half of all possible intervals, whereas in German measles it would only bring in about one-fourth owing to greater variability of the incubation period, a fraction which would be further reduced on account of the higher age-incidence of German measles, and it therefore follows that any considerable admixture with cases of German measles must have the effect of depressing the index of infectiousness as defined for measles. When the German measles notifications are studied independently it is found that there was in fact a pronounced rise of infectiousness in this epidemic as in others.

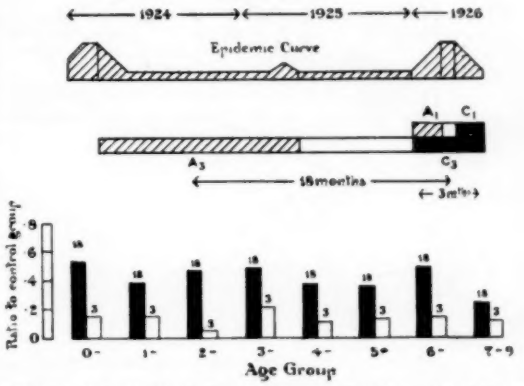
After-history of Contacts.

In Fig. 3 is shown in diagrammatic fashion some of the evidence for temporary immunisation obtained by following up contacts through the 1926 epidemic and this indicates that at all ages up to 10 years children who were intimately exposed to infection but escaped immediate attack were after three months subject to about one-eighth of the attack-rate of a control group, but after 18 months had elapsed they were subject to nearly half that of the control group. The relative values of these fractions suggested a disappearance of latent immunity at such a rate as to be complete after about two and a half years. I have recently sought for further confirmation of this finding by taking out from the records of contacts 304 children aged 1–9 who had never had measles up to the end of 1927 and who had been exposed to infection from a case in the same house during the period March, same extent as for the contacts, so we cannot measure the rate of decline from the size of this ratio alone, but as far as it goes it confirms the conclusions previously drawn.

Process of Immunisation.

In Fig. 4 an attempt has been made to show graphically what would happen to two groups of 1000 children each, (A) born simultaneously at the start of an epidemic, and (B) born simultaneously at the end of an epidemic, on the following assumptions: (1) that an epidemic recurred every two years, three-quarters of all cases in the two years occurring in the epidemic six months and one-quarter in the remaining 18 months; (2) that children fell victims to measles in successive two-year periods at the smoothed rates for each age obtained by Collins in his recent analysis of measles histories[7]; (3) that latent immunes were produced at the rate of three to each case; and (4) that this latent immunity was lost at the uniform rate of 50 per cent. in one year and 100 per cent. in two years. The lower curves in the left-hand portion of the figure show the increase

FIG. 3.



Evidence for latent immunisation in measles. Attack-rate during period C in children under ten who had never had measles but had been exposed to infection from a case in the same house during period A, in terms of expected attack-rate during the same period C.

TABLE II.—*Distribution of Intervals between Pairs of Cases in the Same House in St. Pancras, 1924–28.*

No. of days interval between onset of rash..	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Measles	96	90	99	173	206	318	353	329	269	205	153	104	70	48	38	35	*	*	*	*	*
German measles ..	—	4	6	—	2	2	3	7	6	8	5	8	4	6	3	1	4	—	1	1	—

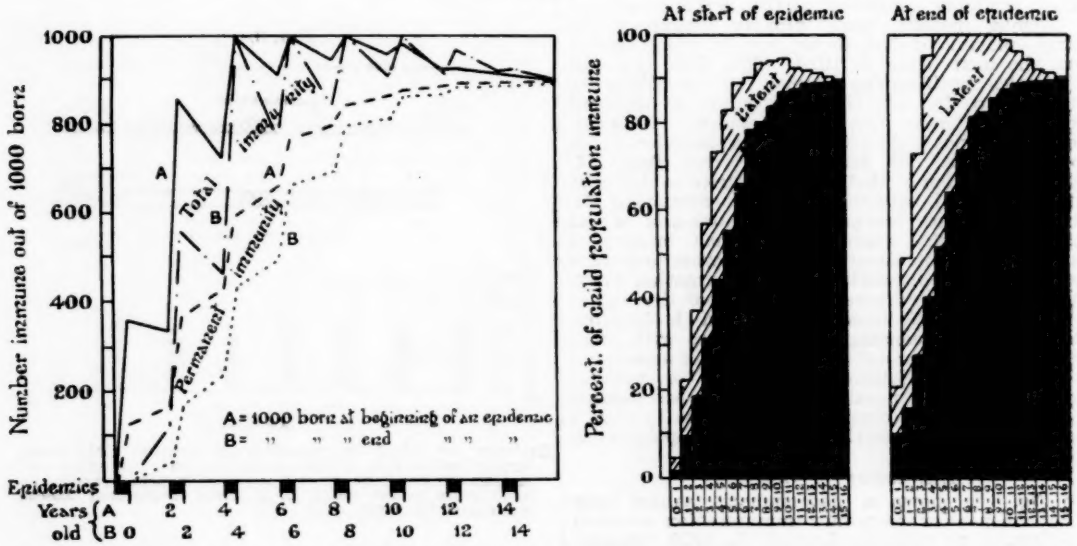
* Not analysed.

1926, to July, 1927, and following them through the epidemic of 1928. By correcting their ages to the beginning of 1928, allowing for removals in the interval as estimated from changes in the electoral registers and applying the case rates per 1000 children at risk in St. Pancras at each age, the expected attacks during each month of the 1928 epidemic were calculated and compared with the actual attacks. The numbers were not large enough for any detailed analysis, but for the whole group with a mean interval of 19 months between previous exposure as a contact and exposure to risk in the epidemic the actual cases were 28, giving an attack-rate per 100 of 9·21 ± 1·11 as compared with an expected rate of 14·56. There is a significant difference here and the ratio of actual to expected attacks was 0·63 after 19 months. It must be remembered that the expected attack-rate would also be reduced by residual latent immunity in the population as a whole, though not to the in communal immunity due to attack, which would not proceed along a uniform curve but in a wavy manner. The upper curves, showing total immunity permanent and latent, indicate that by the end of the fourth year of life practically all the children would be rendered immune by an epidemic, of whom 10 to 20 per cent. would lose their immunity again before the next occurred. The oscillations due to gain and loss of immunity get smaller and smaller, and by the fifteenth year it must be assumed that about 10 per cent. have either passed out of reach of measles infection, acquired a fairly permanent immunity by repeated inoculation, or have had some immunity since birth of a permanent character.

If we now suppose the children born uniformly over the two years instead of instantaneously at two points, we obtain the distributions in the right hand portions of Fig. 4, which show the changes which occur on this basis in the permanent and latent

immunity of children of each age-group in the population from the start to the end of an average epidemic, the available susceptible material for the disease to work upon being indicated by the white unshaded area. It appears that, if the assumptions are approximately correct, almost complete immunisation of the more mobile portion of the child population (that is to say ages 3 and upwards) is produced before the epidemic stops, leaving only very young children unprotected, doubtless those who are not associated much with older children and have therefore escaped coming into contact with sources of infection. At the start of an epidemic the proportion unprotected amongst those who have not had measles would be about 75 per cent. at age 2, falling to about 40 per cent. at ages 5–7. It may seem that this latter figure is incompatible with the 80 or 90 per cent. attack-rate among such children in houses where a case occurs (see Fig. 2), but it must be remembered that the 40 per cent. is an average rate through the population, and since measles will have a greater chance of gaining entrance to households containing a small proportion of latent immunes than to households containing a large proportion of latent immunes, the attack-rate within such households may be expected to be higher.

FIG. 4.



Process of immunisation to measles of children in an urban area, exposed to biennial epidemics, supposing that (1) each clinical case is accompanied by 3 latent cases; (2) latent immunity decreases at a uniform rate to zero in two years.

Progress of Epidemic in Space.

In Fig. 5 I have represented the progress of the 1926 epidemic through St. Pancras by dealing separately with areas half a mile square, as used in Bartholomew's atlas. The key map to the left of the diagram shows also the artificial barriers formed by extensive railway depôts and sidings across which there are no communicating streets, and which have therefore an important influence in determining the directions of spread in this area. The epidemic first appeared in the north-east corner, square F 16 indicated by the figure (1), heralded by a sudden rise in apparent infectiousness at the beginning of December, the index rapidly descending to normal by the beginning of January and the incidence curve (cases arising every ten days) following about three weeks behind. It next spread to the adjoining squares F 15 and G 15, for which there is a double peak, owing to railway sidings dividing the area and preventing spread in a westerly direction; in the easterly portion, denoted by the figure (2), infectiousness rose in mid-December and incidence began to rise early in January. The invading wave then spread southwards; infectiousness rose in square G 16 at the beginning of January and in H 16 in mid-January, and then moving westwards the epidemic reached square H 15, where the index rose to 12 about the beginning of March, and case incidence began to rise some two weeks later. Whilst this was going on, another salient was advancing from the south-east corner (4), where the index rose at the end of December, through the district bounded by the Euston and King's Cross railway barriers 5 (b), and then joining with the other stream. Last of all the districts (7) and (8) which had escaped owing to the peculiar distribution of barriers and absence of sufficient cross communication were affected by a rise of infectiousness in the latter half of March and beginning of April respectively.

No doubt the mapping out of school attendance areas in relation to these barriers plays an important part in determining these definite streams of flow. The squares F 16 and H 15 present perhaps the best examples of the unhampered progress of a measles epidemic over a limited area of streets, and we see that under such circumstances the epidemic lasts 6–8 weeks and is immediately preceded by a sudden increase in apparent infectiousness to about 10 or 15 times its post-epidemic level. The apparent infectiousness then steadily declines with increasing communal immunity in the affected area to a low level in about six weeks, whilst the case incidence is steadily rising, so that at the peak of the epidemic wave the index of apparent infectiousness has got down to about three or four.

Why an Epidemic Starts.

Before I made this analysis I expressed the view in my paper on measles that the sudden rise at the start of an epidemic was due to an increase in the facility of transmission of the virus from child to child, probably brought about by atmospheric temperature, pressure, humidity, and so forth reaching a state specially favourable to transmission, the immunity barrier being also down. This analysis proves that atmospheric conditions cannot be of prime importance in determining the moment of onset, since we cannot suppose that these conditions

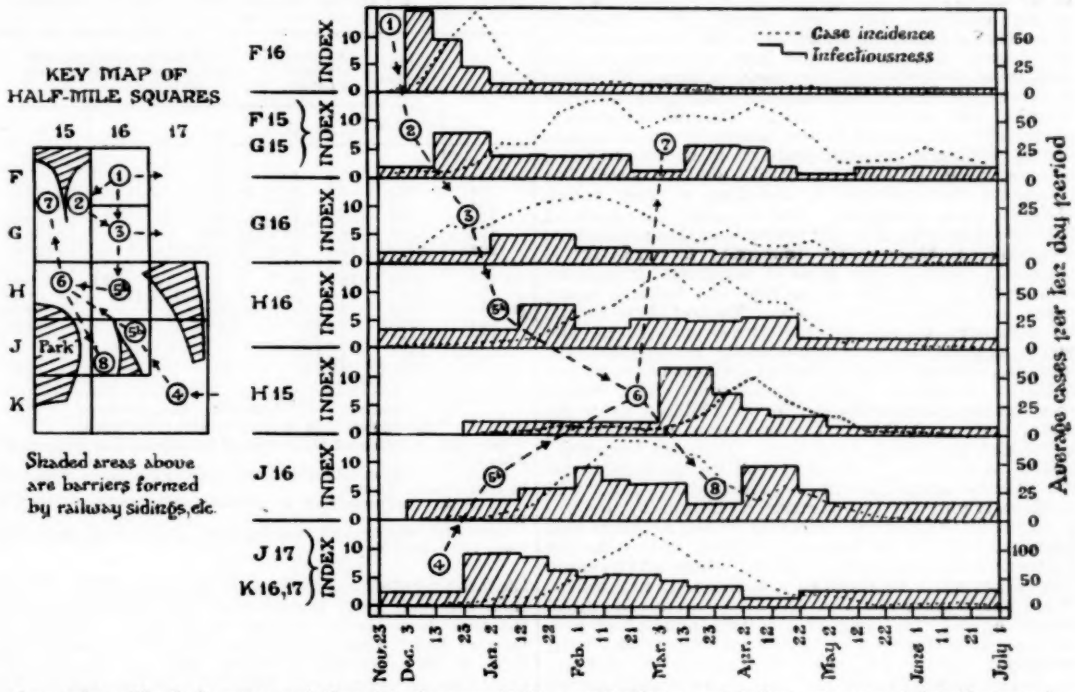
were so different in Chalk Farm (H 15) and Tufnell Park (F 16) that the epidemic started 12 weeks later in the one than the other. The sudden increase in apparent infectiousness must, I think, take place when the activity of the virus, certainly aided to some extent by seasonal influences, rises to a level P, and the latent immunity of the mobile portion of the young children in the area has sunk to a level L, such that the balance between P, L, the density of population D, and the amount of circulation in schools and streets C, swings past a critical point in favour of the virus.

It is just as though we kept on day after day inoculating a bacterium into a liquid culture medium to which some essential constituent, x, lacking to start with, is also being daily added in successive small quantities. No growth at all will occur until a critical concentration of x has been reached, and then rapid growth will suddenly commence. This, I think, is the best explanation of the sudden rise of true infectiousness which precedes the onset of an epidemic in most diseases I have studied, and in saying this I admit it is nothing but Gill's "quantum" theory stated in such a way as to make it rather easier to visualise. The culture medium for an epidemic is the non-immune human population, and free multiplication of the virus is only possible when density or circulation or immunity level of the population may delay or prevent its further advance, in which case that area may escape until later when the infection pressure coming from some other direction is greater or the immunity level has fallen lower so that the balance is then upset—or it may escape altogether, owing to the season having advanced too far, until the next year or the next epidemic. This, I think, is the mechanism of spread of a measles epidemic through an urban community and it fits in well with some interesting observations made by Halliday in the discussion following a brilliant mathematical exposition of the Glasgow measles curve by Soper[8] to the Royal Statistical Society in December, 1928. He said,

> "Now, measles as outbreak takes time to move through a community. In Glasgow, when an outbreak began in September, it was found that it took 24 weeks to pass over the 37 sections or wards of the city. On the other hand, if measles did not begin in the form of outbreak until January, February or March, it followed that the whole city would not be covered until June, July or August. But this did not happen because, owing to the interposition of another factor, the progression of the outbreak in space was frustrated in May or June."

This other factor was seasonal, and it followed, he showed, that an epidemic which started late in

FIG. 5.


KEY MAP OF HALF-MILE SQUARES
15 16 17
F
G
H
J
K
Park
Shaded areas above are barriers formed by railway sidings, etc.
F 16
F 15 G 15
G 16
H 16
H 15
J 16
J 17 K 16,17
INDEX
Case incidence
Infectiousness
Average cases per ten day period
Nov. 23 Dec. 3 13 23 Jan. 2 12 22 Feb. 1 11 21 Mar. 3 13 23 Apr. 2 12 22 May 2 12 22 June 1 11 21 July 1

A measles epidemic in space and time (St. Pancras, 1926): case-incidence and indices of apparent infectiousness in half-mile squares.

the "concentrations" produced by the factors L, C, and D reach a favourable level, and if this happens at a time when seasonal conditions are also favourable, multiplication is suddenly stimulated and facility of transmission increased. Once the balance is upset in this way the epidemic goes forward in the immediate nieghbourhood, which means for a large area just behind the advancing edge of the wave, until practically all the children aged 3 and upwards are rendered temporarily or permanently immune, leaving unprotected only a proportion of very young children who have been sheltered by circumstances from infection. The wave thus spreads outwards until it reaches an area where changes in a large city might leave large tracts of the city untouched and another epidemic might therefore follow in the next year, whereas in smaller towns such as Greenock and Dundee this would not occur, and a regular biennial periodicity was there the rule.

This problem has, of course, been studied some 12 years ago by Brownlee,[9] and it has been suggested that I dismissed his conclusions in somewhat cavalier fashion in my original paper,[10] but my reason for only making brief reference therein to his well-known work was that, whilst I saw that the interesting facts he brought to light by periodogram analysis—for example, that there were distinct periods of 97 and 87 days observable in the recurrence of measles

epidemics in different parts of London, might have an entirely different explanation than the one he gave for them (biological cycles of development of distinct strains of the virus). I had then no data which would enable me to make more than a speculative suggestion about this. I think, however, that the method used in Fig. 5 may enable us to settle this question when we have been able to make a similar analysis of several successive epidemics in the same area, and in the meantime I will only point out that the facts already brought out in Fig. 5 alone—for example, the mere fact that the sudden rise in infectiousness which was the starting point of the epidemic occurred 12 weeks later in square H 15 than in F 16, seem to make it most difficult to accept the explanation Brownlee gave. At the same time they supply grounds for believing that a more interesting reason than the one he propounded will be found for the phenomena which his work brought to light.

Conclusion.

In conclusion we may ask, how does this help us to prevent epidemics of measles? Let us glance one by one at the factors which seem to be involved in the upset of balance which starts the epidemic. The activity of the virus P is beyond our control, and so is the march of the seasons, and the density of population D is a matter which can only be slightly and gradually improved. The circulation C, by which is implied the amount of contact between young children, has been shown by Halliday's researches on the conditions in Glasgow tenements to be of great importance, and here improved housing and, most important in my view, independent access to dwellings rather than common staircases wherever possible, can accomplish much. Careful supervision of nursery schools and infant classes by school nurses during epidemic periods, such as is being practised in some areas of London, should also do something to reduce the exposure to infection of very young children to a minimum. But it must be admitted that the only hope of really preventing these epidemics altogether is through the immunity factor I, for if we could maintain the level of communal immunity at a sufficient height to prevent the balance being upset no epidemics need occur. To do this it might be necessary to ensure that three-quarters of the whole population were temporarily or permanently immune, and unless a method of artificially producing a fairly permanent immunity is found, this would soon become impracticable, for as children grew up under such protection more and more adults would be at risk and liable to attack. It seems, therefore, that as a matter of practical politics we must hope for either a simple method of inoculation which will produce a more or less permanent immunity, or else a simple method of rendering an attack abortive and harmless, such as the proposed method of inoculating contacts with their parents' blood, whilst at the same time allowing it to produce a permanent immunity. From many points of view the latter seems the most promising line, for, even if a certain method of permanent protection were discovered, experience with small-pox vaccination makes it doubtful whether the necessary proportion of the population would accept such protection. It may well be that further knowledge of the march of events which take place as the epidemic wave front approaches a district may enable us, without ever having isolated the virus, to so choose our time in applying some simple method of partial and temporary protection as to allow the wave to immunise most of the children for us without the distressing features, mortality, and after-effects, which we now have to associate with a measles epidemic.

Towards the accomplishment of this end there is only one way—more research from both aspects, experimental and statistical.

References.

1. Stocks, P., and Karn, M. N.: A Study of the Epidemiology of Measles, Annals of Eugenics, 1928, iii., Pts. 3 to 4, pp. 361–398.

(*Continued at foot of next column.*)

Clinical and Laboratory Notes.

IMMUNISATION OF A FEVER HOSPITAL STAFF AGAINST DIPHTHERIA.

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The Birmingham City Hospital, Little Bromwich, was amongst the earliest of the large fever hospitals to introduce the Schick test and the active immunisation of the positive reactors amongst the staff. The results in the earliest years have been submitted to statistical analysis by Hilda M. Woods,[1] who showed that whereas during the three years immediately preceding the introduction of immunisation the attack-rate was 17·8 amongst an average nursing staff of 90, the rate during the years 1922–24 was 3·7 per annum amongst an average nursing staff of 108. Woods showed that the difference between the attack-rates for the two periods was more than four times the probable error—"a greater difference than would be expected as the result of chance alone."

The purpose of this note is to record the results from 1922 up to the end of 1929. Schick testing of the nursing staff commenced in January, 1922. From then onwards only nurses who were Schick-negative reactors have been allowed to work in diphtheria wards; but it should be stated that active immunisation of the positive reactors was not commenced until the last quarter of 1923. Until the end of 1924 only the nursing staff was Schick tested and immunised. From the beginning of 1925 onwards a similar procedure was adopted for the domestic staff

Year.	Diphtheria admissions (crude).	Average strength of staff.		Diphtheria amongst staff. Number and incidence to average strength.		
		N.	D.	N.	D.	C.
				%	%	%
1916	695	80	40	16 (20)	5 (12)	21 (17·3)
1917	632	66	33	16 (24)	6 (18)	22 (22·2)
1918	725	61	30	6 (9·8)	4 (13)	10 (10·9)
1919	799	64	32	10 (15)	3 (9)	13 (13·5)
1920	1349	98	49	24 (24)	8 (16)	32 (21·8)
1921	1301	108	45	14 (12·9)	5 (11)	19 (13·0)
(*a*) 1922	1090	108	45	7 (6·4)	3 (6·6)	10 (6·7)
(*b*) 1923	1409	108	45	4 (3·7)	4 (8·8)	8 (5·4)
(*c*) 1924	1734	108	45	1 (0·95)	5 (11)	6 (4·0)
(*d*) 1925	2005	C. 130*		—	—	1 (0·76)
1926	2003	C. 131*		—	—	1 (0·76)
1927	1842	C. 130*		—	—	0
1928	1909	C. 162		—	—	0
1929	2106	C. 166		—	—	1 (0·6)

N. = nursing; D. = domestic; C. = combined.

* Reconstruction of some scarlet fever wards.

(*a*) Differentiation of nursing staff by Schick test commenced Jan. 28th.

(*b*) Active immunisation of nurse-positive reactors commenced in last quarter of year.

(*c*) Active immunisation of nurse-positive reactors through year.

(*d*) Schick testing and immunisation of domestic staff also, from 1925 onwards.

[1] Jour. Hyg., 1928, xxviii., 147.

References.

(*Continued from previous column.*)

2. From Table VII., p. 371 of reference No. 1.
3. Gill, C. A.: The Genesis of Epidemics, London, 1928.
4. Proc. Roy. Soc. Med., 1913, vi., 1267.
5. Ibid., 1929, xxii., 575–576.
6. Medical Research Council, Special Report Series No. 120, 1928.
7. Public Health Reports, U.S. P.H. Service, 1929, xliv., No. 14.
8. Journal of Royal Statistical Society, 1929, xcii., 68.
9. Proc. Roy. Soc. Med. (Section of Epidemiology), 1918–19, xii., 77–120.
10. Brit. Med. Jour., 1929, ii., 111.

also, since when no nurse or maid has been allowed to work in a diphtheria ward until known to be Schick negative, whether as the result of active immunisation or not. No Schick-negative reactor has contracted clinical diphtheria. The above Table sets out the main facts. The *average* yearly strength of the nursing and domestic staffs is given.

It is clear that the average strength does not represent the real number of persons at risk in any year. Changes amongst the members of both staffs result in a varying number of fresh non-immunes being at risk for short periods in each year. For example, in 1929, there were 129 nursing and domestic new entrants of whom 41 (31·7 per cent.) were Schick-positive reactors. In the Table is also shown the crude number of cases admitted to the hospital with a diagnosis of diphtheria in each year. This figure includes all cases of so-called bacteriological diphtheria and all cases in which the diagnosis was revised to some other condition. The number of cases of true clinical diphtheria admitted in each year was from 21 per cent. to 33 per cent. (1929) less than these crude totals.

The immunising mixture first used was toxin-antitoxin (T.A.T.), later toxoid-antitoxin (T.A.M.), or modified toxin (M.T.), and during part of 1928 and throughout 1929 toxoid-antitoxin floccules (T.A.F.). So far as our experience has gone with the last-named preparation, it would appear to be superior in immunising value to any of its forerunners—i.e., in rapidity of immunisation. Its use in the immunisation of adults has been attended by a notable freedom from reactions.

THE FŒTAL HEART BEAT.

AN OBSTETRICAL EXPERIMENT.

By C. Russell Corfield, M.D. Brux., L.M.S.S.A., D.T.M.,

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An interesting experiment has recently been concluded in the obstetric department of this hospital, the object of the research being: (1) to verify the statement that the maximum point of audibility of the fœtal heart beat is a reliable guide to the ultimate presentation; (2) to determine, if possible, the relationship of the rate of the fœtal heart beat to the sex of the child; and (3) to determine the possibility of a relationship between the age of the mother and the sex of future children.

Three separate groups of a hundred cases each were included in the experiment, and with few exceptions the findings were almost identical in each group.

It was found that the fœtal heart beat in quite normal cases has a wide range, much wider than 130 to 150 with an average of 132, as taught in many text-books; therefore an apparently unduly slow or rapid rate does not necessarily foretell distress or disaster to the child. The average rate lay between 112 and 180 per minute, and on further investigation these rates fell into six distinct and well-marked groups, each with an average age-incidence and sex value.

Group.	Average fœtal heart beat.	Average age-incidence.	Percentage of predominant sex.
1	112 to 120	27·6	66·6 females.
2	121 to 130	28·16	58·3 ,,
3	131 to 140	24·74	51·1 males.
4	141 to 150	28·0	57·1 females.
5	151 to 160	28·85	75·0 ,,
6	161 to 180	35·0	100·0 ,,

This Table suggests that a woman's chance of bearing a son is 2 to 1 against if she falls into groups 1 or 2; this is against the usual teaching that suggests that a low pulse-rate favours the male. The majority of births fell under group 3 with a fœtal heart beat of 131 to 140, an age-incidence of 24·74, and a sex value of 51·1 in favour of the males. It will be noted that this is the only group where the males predominate. In group 6 were placed the later primiparæ and multiparæ; here we find the highest age, fœtal heart beat, and female sex value 100 per cent.

The following suggestions are gleaned from the results of this small research.

(1) There is no doubt that the position of the maximum audibility of the fœtal heart is a fairly reliable guide to the ultimate presentation of the child; no less than 75 per cent. were found to be correct.

(2) It cannot be said that the fœtal heart beat foretells definitely the sex of the fœtus, but there certainly appears to be a relationship and a fairly well-established range of fœtal heart beats at different ages. The fact that in groups 1, 2, 4, 5, and 6 the predominant sex is female suggests that a fœtal heart beat of 141 to 180 in late primiparæ and multiparæ favours the prognosis of a female child.

(3) There is no doubt that the chances of a woman having male issue become less as she travels along the child-bearing period. This might be an interesting point in medico-legal argument, and in questions as to the desirability of late marriage.

(4) The experiment suggests that the best age of expectation for male issue is between 24 and 25 years of age.

New Inventions.

A LARYNGEAL MUCUS EXTRACTOR.

I have devised a simple piece of apparatus by which mucus can be extracted by suction from the mouth of the infant without any risk of its reaching the mouth of the operator. A thorough trial has been given to this pattern in the Rotunda Hospital Dublin. It comprises two portions of metal tubing connected by an intermediate chamber, itself divided

into two parts, which can readily be separated for cleaning. Within the upper portion or lid of the chamber is a detachable baffle in the form of a conical disc or dome provided with a U-tube, one end of which passes through the centre of the dome and screws into the suction tube, whilst the other end terminates on the upper surface of the dome which dips into an annular recess in the lower portion of the chamber. The trap thus provided prevents any mucus reaching the chamber from passing up the suction tube.

The instrument is made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

Amîn Büktor Rufail, M.R.C.S. Eng., L.R.C.P. Egypt.

Nottingham Hospitals.—Nottingham General Hospital last year admitted 6755 in-patients who cost £2 19*s.* 9*d.* each per week, a slight reduction on the previous year; the average cost per occupied bed was £155 8*s.* 9½*d.* The Hospital Saturday Fund raised over £30,000.—Almost the final act of the Nottingham Board of Guardians was to open recently a new Children's Hospital at Bagthorpe, which has cost £49,000. Accomodation is provided for 56 children under 8 years of age, and an equal number of older ones; another block provides for 42 convalescent children, and there are two isolation wards.—It has been decided to enlarge the Nottingham and Notts Convalescent Homes at Skegness by erecting a new Home for Women at a cost of £15,000. Last year the Homes received 1461 patients.

Medical Societies.

TUBERCULOSIS ASSOCIATION.

ANNUAL CONFERENCE AT OXFORD, APRIL 3RD TO 5TH.

MEMBERS enjoyed the hospitality of Somerville College and the meetings were held in the Pathological Theatre, the chairman being Sir STCLAIR THOMSON, President of the Association.

CONTACTS.

The discussion was opened by Dr. G. JESSEL (Cons. Tub. Officer, Lancs C.C.). The examination of contacts was, he said, not regarded by most tuberculosis officers with any degree of enthusiasm, it being generally felt that the results of contact examination were not commensurate with the labour and time involved. As there appeared to be no available statistics proving or disproving this point, he had recently undertaken an investigation in his area in Lancashire, comprising a population of over 300,000, with the object of discovering how many secondary cases of pulmonary tuberculosis occurred up to the end of 1929 which could be related to cases investigated and accepted as tuberculous by the tuberculosis officers during the years 1921–24 inclusive. Thus in this period there was a minimum period of five and a maximum of nine years for the possible discovery of the secondary or contact case. The results showed that in 15 per cent. of the primary cases accepted as pulmonary tuberculosis there were instances of one or more secondary cases of tuberculosis following. Nearly all these secondary cases were directly related to primary cases which had tubercle bacilli in their sputum, whilst the average interval between the discovery of the primary and secondary cases was three and a half years. There was thus a statistical basis for believing that contact examination at or about the time of the diagnosis of the primary case was usually barren of results, though, of course, there were exceptions, especially in young adults. A house contact had been defined as a person who had lived in the same house with a known tuberculous patient within six months of the date of examination of the contact. The investigation he had quoted showed that this period was much too short. He thought a minimum of four years was desirable, though there were serious practical difficulties in the way of lengthening the period.

Dr. Jessel then went on to quote figures for Lancashire for the four years 1925–28, extracted from the annual reports of the central tuberculosis officer. For the most part the contacts examined were, in reality, suspects, and the figures showed a rate of 74·8 tuberculous per 1000 contacts as compared with a rate of 4·83 tuberculous per 1000 general population. The percentage of tuberculous contacts which had tubercle bacilli in their sputum was 31·7. He also outlined his method of contact examination and emphasised the following points: (1) it was not difficult to pile up large figures by examining all and sundry, and (2) persons in good health readily submitted to examination, and reluctance to be examined was often a suspicious feature of a case.

Although many tuberculosis officers preferred to examine contacts at the dispensary, Dr. Jessel thought there was much to be gained by examination at home. In the past too much attention had been paid to the child contacts and too little to the adults. In conclusion, he believed that the most profitable contact examination work was to be done amongst the families in which a sputum-positive case had occurred. Even here it was most profitable to limit one's energies to genuine suspects. A single negative examination might well lead to a false sense of security, and, if possible, re-examinations should be made at intervals for at least four years. Home examinations should not be neglected and attention should be paid to adults, especially middle-aged contacts. Workroom and office infection should receive also more attention; here welfare workers might help. Dissemination of knowledge in health subjects was important, as were energy, enthusiasm, and tact in overcoming difficulties.

Dr. NOEL BARDSWELL (Princ. Asst. Med. Officer, L.C.C.), on the principle that the tuberculosis officer saw most of the game, stated that he had issued a questionaire to the 30 tuberculosis officers of the London boroughs. The questions and answers he summarised as follows: (1) What steps do you take to ensure the examination of contacts?—The answers stated that with the exception of one borough where a special session was set apart for contacts, the matter of getting up the contacts was largely in the hands of the health visitors. (2) Do you experience much difficulty in securing attendance of contacts?—The answers indicated that there was difficulty especially with the young adults and those who were ailing and did not wish their worst fears to be confirmed. One tuberculosis officer reported that contacts from better-class districts were more willing to attend than were those from poorer districts. (3) What proportion of contacts attending were diagnosed positive on (*a*) first attendance, and (*b*) subsequent visit?—Taking all the figures together the positives were 8·2 per cent., the figure for the whole of England and Wales being 12·7. For children only the positives were 2 per cent., as compared with 6·3 for England and Wales. Figures for the different boroughs showed considerable variation in the number of contacts who were found to have a positive sputum. (4) What proportion of contacts lapsed before a diagnosis was made?—The answer was "very few." (5) To what extent are negative contacts followed up?—The responsibility of keeping in touch with the contact as long as the focus of injection remained was mainly left to the health visitor. (6) Of what value was the school medical service in giving oversight to suspected children?—There were numerous advantages: (*a*) continual supervision, (*b*) provision of country holidays, (*c*) early reference of cases to the tuberculosis officer, (*d*) facilities for treatment of intercurrent illnesses. In conclusion, Dr. Bardswell said that the tuberculosis officers appeared not to be entirely satisfied with contact examination. How far the records of these examinations bore upon the whole question of infectivity he was not prepared to say. If tuberculosis was ubiquitous the important question still remained: Why does it declare itself only in some people?

Dr. W. BURTON WOOD (Cons. Tub. Officer, Essex C.C.) said that nobody would deny the importance of the examination of contacts, but warned his listeners against the danger of catch phrases, half-truths, and the type of administrative control which might confuse the issue. He drew a vivid picture of the harassed mother trying to do her best and bringing her younger children up for examination, but failing to exert pressure on the adolescent son and daughter who were the most likely members of the family to be positive. Statistics were satisfied and the mother greatly relieved because her young children were pronounced healthy, whilst the chief danger was overlooked. For the task in hand adequate time was needed, together with proper clinical assistance without which clinical acumen was smothered in foolscap sheets whose abbreviated designations absorbed the whole alphabet. Sufficient radiograms were also needed but they should be of good quality and not resemble a myope's vision of a November fog. Expense was wholly unjustified unless it yielded an adequate return. In all well-conducted inquiries into contacts there should be three questions: By whom was the patient infected, whom has he infected, whom may he infect? The first question was often insoluble. Even the harmless necessary cow, despite Mrs. Turner's cautionary tale that "cows do no harm," might be to blame. The

examination of child contacts needed the imagination of a poet, the ear of a piano tuner, and the touch of an osteopath, and there were still clinicians who regarded a child's chest as a kind of Abrams box. Without minimising the importance of the fact that occasionally among child contacts a positive case might be found calling for the closest scrutiny, he thought the statistics of children examined and found negative had no value. He stressed the importance of the young adolescent contact, often beginning with a broncho-pneumonic patch in the subclavicular area and rapidly progressing—the true early case of the infected house. All dispensary arrangements as to contacts should be made subservient to the convenience of this type of patient. Influenza, febrile colds, lassitude, slight blood-spitting should be the signal for immediate and searching examination with X ray control, for X rays had proved how slender was the connexion between physical signs and pathology. In his experience it was very rare to find an early adolescent consumptive who had previously belonged to the swarm of children who buzzed like flies round the dispensary malt-and-oil pots. He found it difficult to believe that mere observation, however prolonged and benevolent, could suffice to prevent consumption. We knew little about primary infection and still less about its relationship to frank disease, but we could, by using every modern aid, diagnose pulmonary tuberculosis in its early infiltrative and exudative stages when treatment could be employed with a hope of success.

Discussion.

The CHAIRMAN said he was impressed by the large number of infected contacts, the importance of the radiogram, the number of unknown factors in infectivity, and the value of actuarial control of the statistics.

Dr. G. MACDONALD (Battersea) found that 60–70 per cent. of contacts were uninfected children. A definite standard of positive diagnosis of childhood tuberculosis was needed. At present too much was left to the personal factor of the physician.

Dr. F. J. C. BLACKMORE (Woolwich) thought more figures were required before any useful conclusions could be arrived at.

Dr. MIDGLEY TURNER (Worcestershire) pleaded for a broad view of the contact. He visualised three zones—viz., house contacts, infected factory contacts, casual contacts. In the first zone he had found 191 fatal cases yielded 833 contacts with 11·6 per cent. positive cases.

Dr. J. CROCKET (Glasgow) found 23 per cent. of his patients had a history of contact.

Dr. C. H. C. TOUSSAINT'S (Bermondsey) figure was 16 per cent. He also gave figures showing that in a collection of cases of tuberculous meningitis nearly half proved to have had a tuberculous parent.

Dr. D. J. WILLIAMSON (Ministry of Health) thought that the value of contact examination depended upon the care exercised in selection. Figures given showed that the contact population had a higher percentage of positives than had the general population. Contact examination was valuable also as a routine examination of a section of the whole community.

Dr. E. WARD (Devon) emphasised the value of contact examination in the home as against dispensary examination, and stressed the help of the general practitioner.

Dr. L. S. T. BURRELL (Brompton Hospital) said the older he got the less inclined he felt to place faith in mere physical signs. The gland case in childhood did not become the adult phthisic. The adolescent case was all-important.

Dr. P. ELLMAN (East Ham) said the old age cases were a great source of trouble, they disliked examination, and were careless and unhygienic.

Dr. W. TEMPLETON (West Sussex) laid stress on the risks of engaged couples amongst the young adult cases.

OLEOTHORAX.

Dr. GILBERT (Leysin) gave his seven years' experience of oleothorax, which method of treatment he considered to be a good adjuvant to artificial pneumothorax when used with judgment. With regard to the mode of action of oil injected into the pleural cavity, he considered that at least four practical results were obtainable: (1) disinfectant action in febrile and bacilliferous pleural effusions; (2) the rendering of the pleural layers thick and impermeable; (3) collapse and compression of the lung; (4) the thickening and making rigid of a healthy pleura, thus impeding the displacement of the mediastinum. The therapeutic indications for oleothorax were the treatment of: (1) certain types of pleurisy complicating artificial pneumothorax (especially serofibrinous and puriform effusions which had become chronic, and true purulent effusions); (2) pleuro-pulmonary perforation (e.g., emergency oleothorax for overcoming immediate distress, or for complications when fistulous opening was small); (3) unsuccessful artificial pneumothorax due to insufficient compression (though there were sometimes contraindications when a partial pneumothorax only had been obtained); (4) progressive symphysis pleuræ which was interfering with successful collapse; (5) mediastinal laxity; (6) as an eventual substitute for air when it was essential to avoid frequent refills. The accidents and complications met with were febrile reactions, perforation of lung, too high intrapleural pressure owing to increased secretion of pleural fluid. Dr. Gilbert described two methods of administering the oil: the one, direct, with a 20 c.cm. syringe; the other with a bulb, such as is used for storing antitoxic serum, with a needle attached to one end and a small bellows apparatus to the other, the antitoxin bulb containing the oil being surrounded with a suitable warm-water jacket. The oils used were liquid paraffin and olive oil, the latter with 5 per cent. oil of gomenol added being the best. The oil must be absolutely pure, it must be sterilised before use, and administered warm. Quantities up to 500 c.cm. could be injected according to circumstances and it was advisable to leave above the oil a small area of negative gas pressure, though a complete "blockage oleothorax" was sometimes carried out. When used for fluid replacement the fluid should be evacuated before the oleothorax was attempted.

In conclusion Dr. Gilbert showed an illuminating set of lantern slides.

Discussion.

Mr. H. MORRISTON DAVIES (Ruthin) spoke of the value of oleothorax in the treatment of pyopneumothorax. An intolerant pleura could often be made to acquire tolerance. Oleothorax was often valuable in eliminating the necessity for constant refills.—Dr. H. DE C. WOODCOCK (Leeds) gave his experience of 300 oleothorax operations. It was a cardinal rule never to do an oleothorax before an artificial pneumothorax. He had used the method as a treatment for interlobar and encysted empyemata. He had found it useless, however, for controlling hæmoptysis.—Dr. PETER EDWARDS (Nantwich) raised the question of the difficulty of checking the intrapleural pressure and was puzzled by the divergent views as to the antiseptic powers of gomenol.—Dr. CROCKET emphasised the risk of shock and febrile reactions, and stated that he had found a Woodcock manometer useful for recording pressure.—Dr. E. T. D. FLETCHER then recorded an interesting case.—Dr. NIVEN ROBERTSON suggested the possibility of combining oleothorax with phrenic avulsion.—Dr. S. R. GLOYNE (Victoria Park) gave his experience in performing oleothorax on rabbits.—Dr. SIMMONDS spoke on the absorption of fluid in oleothorax, and Dr. BURTON WOOD raised again the question of difficulties of controlling intrapleural pressure.

TUBERCULOSIS COLONIES.

Dr. J. B. MCDOUGALL (Preston Hall) said that two charges in particular had been lodged against village settlements—viz., that they were expensive and that

they catered only for the few. It was his personal opinion that the delay in the development of village settlements generally had been due to the fact that settlements were assumed to be necessarily expensive and therefore, as far as authorities were concerned, prohibitive. In studying the finance of village settlements conducted on the lines of the Papworth and Preston Hall schemes it was essential to divide the account into three distinct sections—viz., sanatorium, estate, and industries. The subject had then to be considered from the standpoints of capital expenditure and maintenance. In analysing the various returns from settlements he had found it difficult to make comparisons in capital expenditure between one settlement and another because of the different systems employed in presenting the accounts. At Preston Hall the most suitable division of the estimated initial capital expenditure was as follows: Sanatorium section £19,300, estate section £18,670, industries section £1000, to which a further capital sum of £13,654 had been added in the sanatorium section since 1925. On the sanatorium section account, therefore, the total capital expenditure, including the initial valuation, could be put at £32,954, which was approximately £178 per bed, a figure which compared very favourably indeed with other institutions. This relatively low figure was due to the large number of patients housed in hostels and huts. The estimated expenditure on estate section was £18,856. For this sum the Legion could show 121 houses, all, with two exceptions, occupied by ex-patients with their wives and families. The relatively low cost of £403 per house was due to the smallness of the original valuation. These houses, built by capital raised by voluntary subscription, assisted the housing problem of public authorities. Thus, one council had, at present, no less than 27 ex-patients in residence at Preston Hall as settlers and the indirect saving to that particular council was considerable—a point which the critics did not always appreciate. On the remainder of the estate at Preston Hall there had been no capital expenditure beyond £1270 estimated in the original valuation. There was a valuable hidden asset there. When the British Legion assumed control the only department in the industries section which was kept on was the appliance department, the value of which was well covered by £1000. Since 1925 £16,544 had been spent in providing workshops and machinery, bringing the cost of the industries section up to £17,544. They had 145 settlers at Preston Hall, of which 135 were working in three departments of these industries. Dr. McDougall was of opinion that this number could be increased to 140 without additional capital expenditure. The capital expenditure, therefore, to enable each man to become permanently a more or less economic unit was approximately £125—i.e., less than the cost of the treatment of one patient for one year in the majority of sanatoriums in this country—an estimate which he believed would apply to other colonies.

It had been the practice at Preston Hall, Dr. McDougall said, to deal with maintenance under three heads also—sanatorium, estate, and industries. The sanatorium section was obviously in the hands of local authorities who had patients to send them, and the ex-Service men were a diminishing quantity. With these difficulties and a fluctuating bed list there were necessarily fluctuations in the sanatorium balance-sheet. During the past year, however, they had been able to administer the unit and preserve financial balance by charging local authorities £2 12*s*. 6*d*. per patient per week. In 1927–28 there was a profit of £105, in 1928–29 £195. In the estates section the incomes came from rents. Villagers paid from 4*s*. to 9*s*. per week and no rates. Neighbouring farmers rented portions of land. On the expenditure side there were the wages of the settlers on the estate staff, audit charges, &c. No allocation for depreciation had yet been made because the initial valuation of the estate property had been on the conservative side. Probably a reserve fund would ultimately be set up to meet this depreciation. Owing to the growth of the neighbouring town of Maidstone the capital value of the Preston Hall land was appreciating each year. The estate accounts for 1925–29 showed an excess of income over expenditure of £978. If economic rents had been charged the income would have been almost double.

The industries section showed total sales of £198,024 between 1925 and 1929. Salaries, wages, and commission during that period came to £66,160. No interest on capital was debited to the industries account and no portion of the medical director's salary was included. The average loss per annum during the period was £1080—i.e., a loss of 1·8 per cent. on a turnover of £198,024. The average number of settlers on the wage list during these years was 95 and the average loss per annum per settler was therefore £11 7*s*. 4*d*. The results of the present year had convinced him that it would be possible to run the industries at a loss of £10–£15 per settler per annum. The problem of orders and labour was baffling. It would be easy to go into the open labour market and engage hands to catch up with excess orders, but that policy would not stimulate the healthy growth of the settlement. The industries section was only one part of the settlement, and the British Legion had, at Preston Hall, regarded the three sections as one unit. In conclusion, there were many thousands of tuberculous patients receiving more per annum from approved societies and disablement benefit than was necessary as a subsidy to keep them at work as productive units in a settlement.

Dr. E. L. SANDILAND (Barrowmore Hall) emphasised the wastage in life and labour which went on daily by the present method of discharging a patient direct from a sanatorium on to the labour market or the ranks of the unemployed. The ideals of a tuberculosis settlement had been often stated, but could they be put into practice at a reasonable cost? The experiences of Papworth, Preston Hall, and Barrowmore Hall had shown that they could. The latter had come through a rickety youth unsupported by financial vitamins from the Government and now only required an annual premium of public support to ensure its future. It had now 120 sanatorium cases, 12 cottages, and a hostel for ten single settlers. Eight dependents had been employed in the settlement, though none as yet in the industries. Three advanced cases had died 18 months after settlement, being employed for short hours during that period, and five unmarried settlers had left, in some instances to get work elsewhere, in others to get married. There were now 26 settlers on the estate. A table was shown giving the length of time these men had been settled and their periods of invalidity. The industries carried out were woodwork, upholstery, boot repairing, decorating, poultry farming, gardening, and clerical work. Of these 26 settlers, 12 had had tubercle bacilli in their sputum. The amount of time lost through sickness was 2·2 per cent. of the working hours. There was a special fund from which the dependents could be assisted during these short periods of illness. Dr. Sandiland stated that experience had impressed upon him the following facts: (1) tuberculosis settlements have a definite place in any antituberculosis scheme; (2) one colony is sufficient for a large area, if adequately supported; (3) the sanatorium section must be the centre and controlling authority of the whole settlement; (4) all workers must be under continuous medical supervision; (5) the sanatorium section must be kept full in order to have a good supply of possible settlers from which to select; (6) the medical superintendent must have a personal interest in everybody in the settlement; (7) skilled labour is expensive to train, there must be industries which will absorb unskilled labour; (8) settlements should be made by extending existing sanatoriums; (9) they should be of size most suitable to function economically; (10) much depends upon the type of men chosen for the early settlers; (11) although there may be small beginnings

foresight is essential; (12) a study of suitable markets and trades is essential; (13) settlements should be near big centres of population; (14) the financial side must not be fettered by restrictions—a certain amount of floating capital is necessary; (15) a settlement, with its sanatorium, should aim at accepting all types of case.

Discussion.

Dr. BARDSWELL asked why no public authority had undertaken a settlement. One reason was that those authorities had never had the financial position clearly put before them. The finances of the scheme must include the failures as well as the successes, and a large pool of subsidised labour seemed to be necessary to reinforce the trained skilled settlers if success was to be attained. At present public authorities dare not consider schemes which benefited only a small percentage of the tuberculous population needing assistance.

Dr. A. SANDISON (Min. of Pens.) believed that the choosing of medical superintendent and settlers was a highly skilled occupation in itself. He was also impressed with the divergence in figures of losses at different settlements. One difficulty which he foresaw was the automatic blocking of the waiting-list which would naturally occur as time went on.

Dr. EDWARDS agreed that the capital cost of a settlement was too high for any public authority to face nowadays. He also believed that any profits made should be left in the scheme, which a public authority would not do. Patients capable of being reabsorbed into the ordinary life of the outside world should not become settlers.

TREATMENT BY TURTLE VACCINE.

Dr. W. C. FOWLER (Pinewood) said the vaccine consisted of a living culture of an acid-fast bacillus isolated from a sea turtle cultivated by a special method not divulged. It was put up in sealed capsules in three strengths—very weak, weak, and strong. It had to be used within one month of its despatch from the laboratory, and microscopic examination showed the presence of acid-fast bacilli with a marked tendency to clumping. No contaminations were found. The bacilli were only feebly acid-fast as compared with Koch's bacillus and were shorter and thicker. Advanced laryngeal tuberculosis, lupus vulgaris, and meningitis were excluded from treatment by its sponsors. One injection only was required—subcutaneously in the gluteal region—and as a rule no immediate reaction followed. From 14 days to five months later in more than half his cases a small dusky red subcutaneous nodule appeared. The nodule generally remained for several weeks, discharged a slightly turbid serum, and healed as a depressed reddish scar. Pain was present but not severe. He had observed no secondary infection. Of 22 more or less chronic stationary pulmonary cases four had definitely improved, three had slightly improved, one had died of hæmoptysis, two had more slight hæmoptyses, two had developed tuberculous enteritis, and the rest had shown no appreciable change. Of four advanced pulmonary cases two had died and one was very ill. Of ten artificial pneumothorax cases improvement had followed in seven. Of eight early cases two had done remarkably well, four were doing well, and two showed no progress. One case of tuberculous peritonitis with effusion had gone downhill, but after paracentesis had improved.

Dr. G. E. SOLTAU reported that a number of early cases had been treated at Nayland with, on the whole, satisfactory results.

Dr. A. H. LANKESTER reported 44 bone and joint cases treated at Carshalton. Of these, 19 cases proved to be definitely tuberculous; five had much improved after vaccine treatment, eight had slightly improved, three were in statu quo, and three were worse. The remaining 25 were cases in whom subsequent investigation negatived the diagnosis of tuberculosis. They had all much improved.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

AT a meeting of this Section held on April 2nd, Sir HOLBURT WARING, the President, in the chair, a discussion on

AMPUTATIONS AND THEIR RELATION TO THE ARTIFICIAL LIMB

was opened by Mr. C. MAX PAGE. Though amputations were, he said, the oldest branch of surgery, teaching on the subject was largely academic until the Great War forced its practical aspects on the medical profession. The 50,000 amputees in this country had provided a stimulus to both surgeon and limb-maker. He was limiting his remarks to the technique and treatment of amputations in which sepsis was absent, or present only in a subsidiary form. The aims governing the technique of any final major amputation of either upper or lower extremity could be thus stated:—

1. That the stump should provide a lever of sufficient length and power for the attachment of an artificial limb suited to the level of the amputation.

2. That it should be covered closely by healthy, well-nourished skin or scar, both of which should be mobile on the deeper structures.

3. That no part of the stump should be tender on pressure, nor unduly sensitive.

Leg Amputations.

The first question to arise in a given case was what level of bone section would, under the circumstances, give the most useful stump. In the leg, amputations could be considered under the headings (*a*) the Syme, (*b*) the below-knee, (*c*) the above-knee type. The first was essentially an end-bearing stump, and still had popularity, both in practice and as what he might call an examination gambit. During the war the Syme was entirely condemned in septic cases, and it was important to decide how far it was of value in civil work. Those who had seen a number of these cases would agree in condemning it, as a large proportion did not bear the test of time and in any case could only be fitted with a clumsy prosthesis. He had himself seen a good many Syme's stumps giving good service; he had also been called upon to reamputate a number which were painful and of no functional value.

The below-knee amputation gave a most satisfactory stump if 6 or 7 inches of tibia could be left; indeed, control of the knee could be obtained with as little as 4 inches. If more than 7 inches of bone was left, the skin covering was not well nourished, and the stump was practically certain to ulcerate or be the seat of eczema. It was agreed among surgeons that the fibula should be cut 1 inch above the level of the tibial section. In the case of short stumps he thought it a good thing to take the fibula out altogether, as the head of it often caused awkward friction areas when an artificial limb was fitted.

For above-knee amputations, section of the femur 4 to 6 inches above the level of the knee-joint seemed to give the best functional results; amputations done through the knee-joint were clearly undesirable, but in America, Canada, and Germany the Stokes-Gritti was popular. At pensions hospitals the usual experience was that an end-bearing thigh stump gave trouble sooner or later, the ideal stump being one containing 10 to 12 inches of femur, to which an ischial bearing prosthesis was fitted. Amputations of the thigh at a higher level could often control in a satisfactory manner an artificial limb up to a length of 4 inches from the great trochanter. If less bone than this was available, it was better to resect the femur at its neck, leaving the head of the bone in the acetabulum. To this could be more conveniently fitted a tilting table prosthesis than when 2 or 3 inches of femur had been left in.

Arm Amputations.

The question of level could, said Mr. Page, be generalised much as in the lower extremity. The points in the technique in any amputation which seemed to give the best results could usefully be considered in relation to flap-cutting, the bone section, and nerve-end treatment. In this country it seemed to be generally agreed that the end of the bone in an amputation stump should be covered only by skin. Flaps should be so cut that their nutrition and their innervation were as far as possible preserved, and therefore some muscle and fascia should be included in the base of the flap. Clearly, the shorter the flaps the better their nutrition, and in general the skin could be cut as in a circular or elliptical amputation, such short side-cuts being made as were necessary. Long flaps should be avoided. The scar which united the flaps should come on the posterior aspect of the stump in the case of the leg, while in the upper extremity it should be approximately central or terminal. The total length of the flaps designed should not much exceed the diameter of the limb at the level of the bone section. Redundant loose covering of the stump, especially in fat persons, interfered with the successful fitting of a prosthesis.

In cutting through the bone the aim was to prevent spur formation, yet it must be admitted that many stumps showing it were satisfactory. He thought spur formation was due to a tearing up of the periosteum at the time of section, or to the extrusion of marrow containing bone-forming cells. This could be prevented by dividing periosteum half an inch above the proposed line of bone section, and scraping it down the shaft. In that way the saw-cut was made through bone which was denuded of periosteum. Attempts to cover the cut end of the bone with an autogenous or pedicled graft were not much favoured in this country.

Treatment of Cut Nerves.—Drainage.

So far no procedure had given certain promise of preventing the formation of an end-bulb. The nerves which subsequently gave most trouble were those which arose in the smaller cutaneous branches. The stump of the nerve should not be attached to the scar, nor should it lie where it could be pressed on by the prosthesis. He did not think it was satisfactory in practice to pull down the larger nerves and cut them high up; he had seen severe post-operative pain which seemed to have been attributable to the trauma of the nerve trunk. He preferred to crush and cut all recognisable nerves about an inch away from the level of the bone section, following this by the injection of absolute alcohol into its stump. It was important to secure freedom from pain following the operation, the time when the nervous system was most sensitive. Otherwise there might ensue a jactitating stump.

As a general practice he thought it well to carry out drainage for 24 to 48 hours. Hæmatoma in early stages was most undesirable; not only did it interfere with the skin nutrition, it was liable to be followed by a low-grade suppuration.

Finally the views he had enunciated he wished to be regarded as applicable to stumps which were expected to be final in character. The full function of a stump depended on its normal position being maintained during convalescence, and keeping its musculature in good condition. The importance of avoiding post-operative joint contracture was now well recognised, and it was common to use early temporary pylons.

Discussion.

Mr. P. J. VERRALL said that coöperation between operator and limb-fitter was of the first importance. It was so at Roehampton. The Syme amputation was admirably suited to the native in the East, for he had no opportunity of wearing an artificial limb. In Europe, where artificial limb-making was so good, it was found that after six or seven years a Syme began to go wrong; the lower part divided posteriorly or to one side. The level at which bone was divided and flaps made was determined largely by the scar. He did not like a posterior scar in a below-knee amputation; he had always used a postero-external flap. He felt contempt for spurs. Periosteum he divided on a level with the bone. Though for a long time he carried out drainage in amputation cases, for a year he had given it up. If he felt in doubt about a case, he stitched muscle with interrupted suture, especially in thigh stumps, but not closely. Splinting of the knee for below-knee amputations was important. No dressing was done until the fourth day. No hæmatoma was ever stopped by putting in a tube; it was rarely necessary to evacuate; a small hæmatoma was usually absorbed.

He insisted on the importance of remaining in bed for three weeks after amputation. He treated nerve-ends similarly to Mr. Page; he did not pull them down much, and certainly he would not avulse them. When circulation was unsatisfactory, it was generally because the stump was too long. When bursæ formed on the stump he advised leaving them alone; cutting a bursa out produced a scar, and that was liable to be rubbed into a sore. Faced with unsatisfactory arm stumps the surgeon should not indiscriminately remove all nerve bulbs, but only when a complaint of tenderness was made. Plexuses and nerve roots should not be interfered with. The upper limb was to some extent a sense organ; most of the pain felt in a stump was of central origin, the brain had little to do, and the importance of fitting an artificial limb early was that it gave the patient an objective. Experience at Roehampton was against disarticulation at the shoulder-joint for shivering arm stumps.

Mr. R. D. LANGDALE-KELHAM said it had been on the principle of trial and error that in this matter of limb-fitting after amputation definite facts were established. The civilian population was largely in the hands of the limb-makers, some of whom were good, others lacked anatomical knowledge. Many amputees were suffering unnecessary discomfort. The ideal above-knee stump for a prosthesis was one at the great trochanter, and for this type two forms of limb were available: (1) the American or central knee control; (2) that depending for its action on a special type of pelvic band and knee connexion. Under-support was better than over-support, for the patient was encouraged to develop his own powers. It was better as a rule to leave neuromata alone, but removal might enable a limb to be fitted. Sooner or later every stump over 12 inches in length would develop circulatory troubles, requiring eventually reamputation; he was not referring to disarticulation at the knee, but to the Stokes-Gritti operation. He had a strong dislike of the Syme amputation, though admittedly the Syme stump was a powerful one. Its average life, however, was no more than ten years. Callosities formed sooner or later in every Syme stump, and became very painful; sometimes they were actually in the scar. The ideal site for a below-knee amputation was 6 to 7 inches below the knee. The surgeon's responsibility did not cease when he had sent the patient, with or without a prescription, to the limb-maker; he should assure himself that the man had a limb which fitted his stump properly, and was one he could make use of. Moreover, the limb-maker required surgical advice and supervision. At Roehampton it had been found that the better the limb-maker the more did he welcome the surgeon's coöperation.

Captain A. R. MAXWELL said there were three factors to consider—the surgical, the technical or mechanical, and the psychological—and these could not be considered apart without harm to the patient. It was much simpler to provide an artificial limb for the lower extremity than for the upper, for the arm was a more complicated piece of mechanism with its requirements of flexion, extension, abduction, adduction, pronation, supination, and ability to grip. A stump might be surgically good but prosthetically bad; if prosthetically good it could not be surgically bad. The surgeon should plan his amputation to

accord with the prosthesis to be fitted, and give use and comfort. Some of the younger men studying for the Fellowship came to Roehampton to learn the use of appliances. There could be no standardisation in these matters; each patient presented his own peculiar problem for solution. In his own case the arm stump was less than 3 inches long, yet he could dig, plough, and use tools for wood and metal work. He emphasised the value of the will to succeed.

A demonstration was given of fitting artificial limbs.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Sheffield on Feb. 28th, Dr. J. W. BURNS, the President, being in the chair, when a discussion took place on a paper read by Mr. W. W. KING (Sheffield), at the Manchester meeting on Jan. 24th, entitled

THROAT INFECTIONS AS AN ÆTIOLOGICAL FACTOR IN PUERPERAL SEPSIS.

Mr. King in this paper suggested that hæmolytic streptococci can be conveyed to the genital tract of a parturient woman by "spraying" from the throat of an attendant. In his view faulty antiseptic methods could not be the sole cause of puerperal sepsis because the rate had not fallen during the past 20 years in spite of the almost universal use of antiseptics, and because puerperal sepsis occurs in "born before arrival" cases, in hospitals in spite of every care, and in the private practice of even the most careful doctors and midwives. Hæmolytic streptococci, recognised as the chief cause of serious puerperal sepsis, were a frequent cause of diseases of the upper air passages, especially during the winter months, when the mortality from puerperal fever from all causes was highest.

The rate of admissions to the septic wards of the maternity hospital (the Jessop Hospital for Women), where Mr. King's investigations had been carried out, was constant more or less throughout the year, but hæmolytic streptococcal infections were more prevalent in the winter. Infection from the attendant's hand during this season was unlikely, since the organism was so easily killed by the simplest antiseptic methods. Moreover, of hæmolytic streptococcal infections in the cases under review the natural labours without interference had a higher percentage (46·5 per cent.) than either operative deliveries (34·6 per cent.) or abortions (5 per cent.). Mr. King gave reasons for doubting the possibility of prenatal infection of the vagina or of autogenous infection.

Kanter and Pilot had been the first to suggest in 1924 that puerperal infection could be "sprayed" from the throat of an attendant on to a woman in labour. Mr. King gave case records of 24 cases of puerperal sepsis from hæmolytic streptococci, of which all but three had spontaneous labours, in nearly all of which carriers were found among the contacts. One epidemic stopped when the use of masks was instituted. The conclusion reached by Mr. King was that the spread of hæmolytic streptococcal infection from the throats of "carriers" to parturient women is an important factor in the ætiology of puerperal fever which requires an extensive and coördinated investigation from every angle. On the assumption that this theory was correct he suggested as prophylactic measures: (1) the use of masks for all examinations which exposed the vulva of the patient, either during labour or for post-partum nursing; (2) a pregnant woman who had been in contact with anyone suffering from a sore-throat should have her throat and vagina examined for hæmolytic streptococci; (3) nurses with even slightly sore-throats should be excluded from maternity wards; (4) patients with sore-throats should be isolated; (5) at the first onset of pyrexia a vaginal or cervical swab should be examined for hæmolytic streptococci, not only in order to treat the patient but also to give early warning of the possible presence of a "carrier." Local authorities should seek out "carriers" in connexion with every case of puerperal fever.

Desirability of Wearing Efficient Masks.

The PRESIDENT described two small epidemics which had occurred in a well-equipped hospital of 15 beds; in the first outbreak two, and in the second three nurses had the hæmolytic streptococci in their throats. He had not endeavoured to trace evidence of close association between the carriers and the cases which developed pyrexia, but had no doubt in his own mind that the infection took place during the early days of the puerperium in both epidemics, rather than during the actual labour. This was to some extent supported by the fact that since gloves and masks had been adopted in the wards no similar cases had occurred. Mr. King had focused attention on the hæmolytic variety of streptococci, but the President thought that the non-hæmolytic type which were present in the throats of several nurses in both the epidemics noted by him were also capable of producing a virulent infection in the puerperal woman. They had to guard their patients against all organisms which might be present in the throats of any of the attendants. The whole question of lying-in ward technique required reorganisation and readjustment. At present very stringent rules were made for the labour ward, caps, masks, gowns, &c., were insisted upon, yet within 12 hours of the baby being born the mother had her vulval toilet carried out by a junior nurse who wore neither a mask nor gloves. He asked Mr. King whether the masks usually worn at operations were a sufficient protection to the patient, and whether he had any experience of treatment by streptococcal antitoxin.

Prof. W. BLAIR BELL (Liverpool) agreed that streptococcal infection was often conveyed to patients from sore-throats. Preparturitional vaginal infections by streptococci were not autogenous, but resulted from the introduction of organisms from without. He had called attention to the danger of late coitus in this respect at the Obstetrical Congress in 1925. The acidity of the amniotic fluid (pH about 5·5) made it a valuable antiseptic douche from above. The increased dangers of operations after the escape of the fluid might be explained in this way. Infection might be carried into lying-in wards by visitors. If it was impossible to exclude them, their numbers should be strictly limited. Infection might be carried from one patient to another by bed-pans.

Prof. MILES H. PHILLIPS (Sheffield) was convinced that sprayed streptococci were a very real source of infection of women in labour or recently delivered, and welcomed Mr. King's paper. Dame Janet Campbell had given details of several small epidemics associated with nose and throat carriers of the hæmolytic streptococcus. He referred to experience gained in general and especially abdominal surgery, which had led the great majority of surgeons to insist on the use of a face mask, and gave examples from his own practice of the desirability of using efficient masks. Those made of a single thickness of butter muslin had been shown by bacteriological tests to be quite ineffective. A mask of four thicknesses of surgical gauze (each of which was itself four-fold) was probably effective. Thirty per cent. of the fatal cases recorded at the Congress on puerperal sepsis in London in 1925 occurred after a normal labour, and in 65 of the 256 cases investigated by Dame Janet Campbell in 1921–25 it was said that no internal examination had been made.

The Need for Further Controls.

Mr. LEITH MURRAY (Liverpool) considered that further control experiments were necessary before fully accepting the "droplet infection" theory as conclusive. He did not think that the wearing of masks would lead to any reduction in the incidence of sepsis, and went on to relate briefly two cases of puerperal morbidity which had occurred in a hospital.

The first of the series was subsequently proved to be a case of scarlet fever. Of the 15 attendants in this hospital, six had positive swabs from the throat of hæmolytic streptococcus, and in his opinion this incidence was the result rather than the cause of the morbidity in the scarlatinal case.

Prof. J. S. C. DOUGLAS (Sheffield) pointed out that the difficulty of identifying strains of streptococci should not be allowed to hamper the search for carriers of the organism responsible for puerperal infection. The fact that a certain proportion of pregnant women harboured hæmolytic streptococci in the vagina or cervix without developing trouble, rendered the effect of the introduction of hæmolytic strains by carriers the more noteworthy. Mr. King's thesis, though not proven, afforded such strong evidence that it was worthy of serious attention and would form an important basis for the further attack on the problem of puerperal infection.

Mr. W. GOUGH (Leeds) thought that all throats contained streptococci and that another factor besides this must be looked for.

Mr. A. GOUGH (Leeds) said that the reason why the morbidity-rate had not fallen was possibly due to a greater proportion of primigravidæ than in the earlier returns of the Registrar-General.

Some Criticisms.

Mr. J. ERIC STACEY (Sheffield) whilst considering that every possible channel by which infection could enter ought to be closed, and advocating the use of masks, said he was not convinced that this mode of entry was the main route by which the organisms were introduced. Mr. King claimed only that spraying from the throat was one method by which the infecting organisms could obtain entry; all would accept this, but it should not be allowed to cloud other issues, for example, why in certain cases puerperal sepsis should develop and in others fail to appear. The number of women subjected to the spraying from the throat of an attendant who developed no sepsis was vastly greater than that of those who did, and yet the organisms had an equal chance of introduction. He agreed with Mr. Murray that further controls were necessary. It seemed unlikely that "throat spraying" could occur except from persons actually delivering the patient or the nurse doing the subsequent vulval swabbing. Epidemics of hæmolytic streptococcus infection occurred in gynæcological cases from time to time where all wore masks in the theatre, and where the infection occurred only in a small proportion of patients. A large number of cases arose in which hæmolytic streptococci are not the causal organism, and a few in which the throat could not be the source of infection—e.g., *Bacillus aerogenes capsulatus*. He had recently investigated for another purpose a series of 152 cases of "failed forceps." Twelve of these cases died from puerperal sepsis, but the hæmolytic streptococcus had been isolated from only three of them. In three cases gas-forming organisms were found and in the remaining six non-hæmolytic streptococci. Trauma, associated with an exogenous source of infection, such as fæcal infection, was a factor which must not be lost sight of.

Prof. A. M. CONNELL (Sheffield) thought the individual herself must have hæmolytic streptococcus in her throat if throat infection was to be accepted as the causal factor.

Dr. J. A. STIRLING (M.O.H., Chesterfield), while expressing alarm at the thought that this method of infection might be so prevalent, considered the isolation of contacts in hospital almost impossible. He thought coöperation was necessary between family doctor, hospital, and public authorities.

Reply.

Mr. KING said that he had been careful to state that he did not exclude other sources of infection. It was premature to attempt to grade the importance of his theory in the causation of puerperal fever. He was satisfied that he had produced sufficient evidence to satisfy reasonable people that this avenue of infection must be closed. It did not seem much to ask that obstetricians should adopt the same care for their maternity cases as they did for their gynæcological operations. In regard to controls, Mr. King suggested that the best test of the value of the theory would be the results obtained by the use of masks during the next five years, especially in maternity hospitals. He was confident that if the scheme was conscientiously carried out, puerperal fever in "booked" cases in maternity hospitals would be as rare as suppuration in laparotomy wounds. In anticipation of the objection that a large proportion of the population had hæmolytic streptococci in their throats during the winter months, Dr. Kirk, at his request, had examined swabs from the throats of 50 out-patients taken at random during the month of February, and only one was found to be a carrier. These results confirmed those given in his paper. As Prof. Douglas had said, final proof of the identity of the streptococci in the carrier and victim could only be obtained when accurate classification of hæmolytic streptococci was possible. Almost any organism could be carried to the patient in this way, including anaerobic organisms, which are well known to be occasional inhabitants of the throat. Mr. King found it easier to believe that *B. aerogenes capsulatus* could get into the vagina from the throat of an attendant than that it should get in on the doctor's hands or instruments. In regard to "autogenous" infection, he accepted Prof. Blair Bell's definition. There was surprisingly little positive evidence in favour of preparturitional infection as a cause of puerperal fever. In the scarlet fever case quoted by Mr. Leith Murray the patient might have been the victim of the attendant carriers. The relatively small number of cases of puerperal infection had been put forward as an objection to the droplet theory. The same objection was made to the contagion theory of Semmelweis. No more was known to-day than was known a century ago as to why only a few of those subjected to infection develop the disease. Infection from the rectum was improbable, since it so rarely followed gynæcological operations. He thought that masks made of four layers of butter muslin were probably satisfactory if not worn for more than two or three hours. He agreed that it was not always possible to exclude known carriers from the wards, and if so, reliance had to be placed upon masks. Great watchfulness was necessary to see that the masks were always worn for vaginal examinations and during the administration of enemata as well as for delivery and the subsequent nursing.

DONATIONS AND BEQUESTS.—Mr. George Harding, of 164, Great Russell-street, London, left estate of the value of £18,015. He left the property in trust for his wife and his daughters during their lives, with remainder to the survivor for life, and on the death of the survivor as to one-fourth to Cheyne Hospital for Children, one-fourth to the Hospital for Sick Children, Great Ormond-street, one-half to Charing Cross Hospital, St. Thomas's Hospital, Middlesex Hospital, St. George's Hospital, Westminster Hospital, and the Royal Ear Hospital.—Mr. William Brown, of Invercloy, Ayr, and West Nile-street, Glasgow, East India merchant, left, among other bequests, £1000 each to the Ayr County Hospital and the Royal Hospital for Sick Children, Glasgow; £500 each to the Glasgow Royal Infirmary, the Glasgow Western Infirmary, and the Glasgow Royal Cancer Hospital.—Mr. Thomas Hammett, of Chorlton-cum-Hardy, Manchester, who left £15,891, after a few bequests gave the residue of the property to the Royal Infirmary, Manchester; the Eye Hospital, Manchester; St. Mary's Hospital for Women, Manchester; Ancoats Hospital, Manchester; the Children's Hospital, Pendlebury, Manchester; Henshaw's Institute for the Blind, Manchester; and the Boys' and Girls' Refuge, Belmont, Manchester.—Mr. Frederick George Nutting, of Sutherland and London, among other bequests, left £1000 each to the Liverpool Royal Infirmary and St. Dunstan's Hospital for Blinded Sailors and Soldiers.—Mr. James John Blundell, of London, left £5000 to the Freemasons Hospital and Nursing Home; £1000 each to the London Hospital, the Middlesex Hospital, University College Hospital, the Royal Free Hospital, the Royal Northern Hospital, the Brompton Hospital for Consumption and Diseases of the Chest, King Edward's Hospital Fund for London, Dr. Barnardo's Homes, and the National Institute for the Blind, besides other legacies.

Reviews and Notices of Books.

PSYCHOLOGY.

The Process of Human Behaviour. By MANDEL SHERMAN, M.D., Ph.D.; and IRENE CASE SHERMAN, Ph.D. London: Williams and Norgate. 1930. Pp. 227. 12*s.* 6*d.*

THIS volume is frankly experimental and behaviouristic. That is to say, its exposition is based upon the thesis that human behaviour is exclusively the product of neural reaction to environment. The authors give a general account of nervous mechanisms, starting from the irritability of organisms to the structure and function of the human brain. They then describe in the manner of J. B. Watson the first human responses and also give their careful observations on the emotions of newly born infants. They conclude that there is a more or less quantitative relationship between stimulus and response. As can be well understood the thesis leaves little or no room for mind, and the whole study of personality and of social behaviour is based without relent upon the structure and function of the reflex arc and of the glands which govern emotivity. On this level of discussion the book is a good exposition of human behaviour, but for those who feel that the subtler reactions of man need something more than neural mechanisms for their explanation the thesis of the authors will not appear quite so satisfactory.

Psychology's Defence of the Faith. By DAVID YELLOWLEES, M.D., Ch.B. London: Student Christian Movement Press. 1930. Pp. 190. 5*s.*

THIS volume consists of series of lectures given before the Student Christian Movement, 1929; they have otherwise undergone little modification. The author, while being himself a practitioner of psychopathology, is also a man deeply imbued with religious feeling and faith. He has felt the need for bringing religion before the tribunal of psychology and psychology before the throne of religion. He has attempted to show that while psychology throws a profound light upon the religious life, it cannot do anything to alter the fundamental truths of religion or to diminish the glory of religious personages who have inspired mankind throughout the ages. He is deeply impressed with the views of Freud, but in so far as this pioneer is a Determinist, he feels himself more akin to Jung, whose philosophy allows for that human freedom which the religious life needs. The book is unfortunately marred by a certain colloquialism in expression which may have been necessary in speaking to students, but which rings unpleasantly in the ear when read in a serious volume.

"*Just Normal Children.*" By FLORENCE MATEER, Ph.D., Director of the Merryheart Schools, Columbia, Ohio. London: D. Appleton and Co. 1929. Pp. 294. $2·50.

THE author has laid out her book on a plan which has brought out the extraordinary human side of this problem—the difficult child. She has described in a straightforward narrative way the lives of little children, their behaviour, their health, and their intelligence, stating how each was affected by some particular maladjustment, physical, psychological, or both. She tells how the subject of each disorder was studied empirically over a period of time, and how each disorder was corrected. The chapter ends with a series of questions arising out of the case, each question being answered with the wisdom derived from knowledge, common sense, and sympathy. The whole field of child guidance is explored, and the author has tried hard to make her observations and treatment clear to the non-technical reader. She does, however, give such ready answers to the questions which she herself has set that the book may give a false impression to the reader as to the ease with which a maladjusted child is brought back to normality. The book may not satisfy all readers, but the value of the questions which are liberally sown throughout the book and of the case-histories is beyond dispute.

MANUAL OF PHYSICS.

Third edition. By J. A. CROWTHER, Sc.D., F.Inst.P. London: Humphrey Milford, Oxford University Press. 1930. Pp. 562. 14*s.*

As some seven or eight impressions of this manual have appeared its value cannot be called in question. The standard of the book is that of the numerous examinations which are coördinated by the Board of Education under the title School Certificate Examinations, including the revised Senior Local Examinations. The object has been to bring the principles of physics clearly before students, as the author's experience has shown him that a certain assimilation of facts is often not combined with a corresponding general appreciation of the subjects under study. The space devoted to mechanics remains, as in the original issue of the book, predominant, and all who have had any personal knowledge of the difficulties of students will agree that a full explanation of the properties of matter makes all instruction along further and more special lines much easier. The additions to the latest issue of the book will be found mainly in this section and under the heading of electricity.

IMMUNITY AND INFECTIOUS DISEASES.

By A. BESREDKA, Professor at the Pasteur Institute, Paris. Authorised translation by HERBERT CHILD, M.R.C.S., L.S.A., late Hon. Surgeon, French Red Cross; Capt. R.A.M.C. (T.Y.). London: Baillière, Tindall and Cox. 1930. Pp. vi. + 320. 18*s.*

THIS is a series of 15 essays upon different aspects of immunity which Prof. Besredka has especially investigated during the past 30 years. They include a number of subjects, such as the bactericidal power of leucocytes, the bacterial hæmolysins, the problem of the unity or diversity of the streptococci, &c.; but except for the first few chapters the general theme running through the book is the problem of the active immunisation of the individual, with especial reference to local immunity and local tissue vaccination. Briefly, the views of the author, which are now well known, consist in a disbelief in the importance of humoral antibodies, either as factors in or indices of the immune state, and a belief in the supreme importance of especially sensitive tissues, which by local treatment may be rendered immune, and thereby convey a general immunity. On the whole these essays are unconvincing. Many of them are only of historical interest, and it is difficult to know why they should be published to-day. We cannot believe that the distinguished author still holds that "the streptococcus met with in scarlet fever is not the specific agent—that to-day appears beyond a doubt." In many other respects the book is unsatisfactory. The reader who expects to find a reasoned, documented, and scientific exposition of Besredka's views will be grievously disappointed, and will gain the impression that the basis of his recent work is unsound and uncritical. Hardly any notice is taken of experiments or findings which are opposed to the author's views; practically everything quoted goes to substantiate them. The work of the translator does not add to the attractions of the book. His method of approach is so literal that French constructions appear on almost every page. Whilst a translator is bound to render faithfully the sense and meaning of the original, he is not debarred from the idioms of the language he is employing.

"The bodies of the bacilli emulsified in the physiological salt solution are placed in a cylindrical test glass, containing non-heated anti-plague serum, very agglutinant."..... "It was Theobald Smith who had this idea. In preparing

it he did not suspect, at the outset, that he was doing anything but realising a true sensitised vaccine."

These examples will illustrate the use of inappropriate English words which occurs on almost every page. Moreover, although "diastase" is loosely used in France for the whole body of ferments and enzymes, it is incorrect to translate the word literally when speaking of a hæmolysin. Another word which also has a much more narrow meaning in English than in French is "virus," and yet we find it employed as synonymous with bacteria. On page 202 we find the expression "the stock or auto-vaccine."

The past work of the author has given him a deserved reputation in all countries, and many laboratory and clinical workers are anxious to evaluate his new and interesting theories. It is therefore unfortunate that this book will not give much help to those who are prepared to consider new ideas without bias.

ANIMISM, MAGIC AND THE DIVINE KING.

By GÉZA RÒHEIM, Ph.D. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1930. Pp. 390. 21*s*.

THIS is an addition to the now extensive literature of anthropology. The subject is dealt with under such general sections as animism and the psychology of magic, the medicine-man and the art of healing, the divinity of the king as successor to the medicine-man, and the sacrifice of the king as scapegoat for the sins of the people. The collection of native legions which the author has got together is remarkable alike for the width of its references and the repulsiveness of the episodes and examples set down. The section entitled the medicine-man relies for its facts largely upon the recorded habits of primeval races, but it is difficult to see how far these notes on savage life and scenes, even when recorded with some intention of consecutiveness, will be of any value to modern medicine. Serious psychological study, which is now so definitely associated with the study of medicine, is not likely to be advanced by any teaching conveyed by the book, although the habits and customs set down confirm much common knowledge as to the development of civilisation. The design has been to apply the modern principles of psycho-analytical research to explain the workings of the primitive mind.

ELECTROCARDIOGRAPHY.

Principles and Practice of Electrocardiography. By CARL J. WIGGERS, M.D., Professor of Physiology, Western Reserve University, Cleveland. London: Henry Kimpton. 1929. Pp. 226. 30*s*. 6*d*.

THE advent of electrocardiography as a method of examination, the value of which has now received general recognition, sufficiently accounts for the large number of text-books devoted to the subject. A few of these are highly technical. The vast majority, however, are written for the practitioner. Indeed, as Prof. Wiggers expresses it in his preface, they are often content merely to give "arbitrary rules for turning knobs and closing switches . . . . . with empirical directions for interpreting the records obtained." It is refreshing to find a book in which the author has struck out on a new line. As a physiologist with a leaning towards the physical side, Prof. Wiggers is able to speak with authority on the instrumental aspect of the subject. His book is primarily intended to give the medical practitioner a fuller understanding of the physical principles involved. The first hundred pages are devoted to general principles, and a full description is given of the various types of galvanometers in general use. It is perhaps unfortunate that the writer contents himself with describing these various instruments, and does not express any opinion on their relative merits and defects, but nevertheless this section gives all the information which a cardiologist is likely to require on the technical side. The remainder of the book is devoted to a systematic consideration of normal and abnormal records. Typical examples are given of the various abnormal types of electrocardiogram commonly met with in practice; the analysis of the records is explained, the physiological and clinical significance of the disorders is discussed, and treatment is considered.

This book, written by a physiologist for clinicians, could with advantage have been published as two separate volumes. The presentation of the physical aspect is admirable, and without being too technical gives a very complete account of the subject. It will appeal essentially to the cardiologist who is interested in the scientific side of his work. The clinical section, however, is rather too elementary for him. It would serve well as an introduction to electrocardiography for the general physician or for the physiologist who is less familiar with clinical problems. The illustrations are excellent, and the general get-up of the book leaves nothing to be desired.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVII. January–March, 1930.—Dr. Fergus R. Ferguson and Dr. Macdonald Critchley contribute a Clinical Study of Congenital Neurosyphilis, Part II., in which they record their observations on 36 cases, eight of which were congenital tabes, 12 congenital tabo-paresis, and 15 congenital general paralysis of the insane, while one was not classified. The clinical aspects of the cases are described and compared with some of the other cases collected from the literature. A useful bibliography is appended.—Dr. C. Worster-Drought and Dr. T. R. Hill report a case of Arrest of Physical Development (with Respiratory Dysrhythmia) following Epidemic Encephalitis in a boy aged 14, in whom the symptoms dated from an attack of epidemic encephalitis four years before. They suggest that the condition is due to the hypothalamic centres being involved to a much greater degree than occurs in post-encephalitic obesity and in the dyspituitary syndromes approximating to the Fröhlich type which occasionally follow epidemic encephalitis.—In a paper on the Treatment of Spastic Paralysis in Children, Dr. J. G. Johnstone, medical superintendent of the Heatherwood Orthopædic Hospital at Ascot, maintains that much can be done by operation to alleviate spastic paralysis in a very large percentage of cases. He regards Stoffel's selective motor nerve resection as the method of choice in all cases, as it yields the best results, is always easy of application, and requires less prolonged after-care.—Dr. Jean Smith describes An Unusual Cardiac Malformation: Cor Triloculare Biventriculare with Mirror Picture Dextrocardia. The patient was a male infant, aged 36 hours, admitted to hospital with marked cyanosis and considerable respiratory distress. The apex-beat was in the fifth right intercostal space. No thrill was felt and no murmur was heard. Death took place 16 hours after admission and the condition described in the title was found at autopsy.—Dr. Hilda N. Stoessiger records a case of Recovery from Pneumococcal Meningitis with a review of the few other cases reported in the literature. The patient was a girl, aged 5 years, in whom the meningitis was secondary to otitis media. Organisms resembling degenerate pneumococci were seen in films of the turbid cerebro-spinal fluid, but no cultures of the organism were obtained. Recovery followed subcutaneous and intrathecal injection of 0·5 per cent. mercurochrome solution.—In a paper entitled Some Pædiatric Eponyms II. Parrot's Nodes, Dr. Walter R. Bett gives a translation of Parrot's original description of the nodes in his Maladies des Enfants (Paris, 1886), followed by an account of his life and his other contributions to medicine, and illustrated by a fine portrait and a plate of a natiform skull.—The abstracts from current literature are devoted to dermatology and syphilis.

THE LANCET.

LONDON: SATURDAY, APRIL 12, 1930.

LOCAL GOVERNMENT AND HOSPITAL ACCOMMODATION.

THE Committee of King Edward's Hospital Fund for London has prepared a useful memorandum on the powers and duties of local authorities in the matter of hospital accommodation under the Local Government Act of 1929. Its form—almost a "counsel's opinion," drawn up by Mr. A. M. TRUSTRAM EVE—is significant of the complexity of the legal position. Indeed a further minor modification has already occurred since the memorandum was framed, as references to the Poor Law Act of 1930 (which received the Royal Assent on March 20th) must now be substituted for the corresponding references in the memorandum to the Poor Law Act of 1927. The chief changes which last year's Local Government Act brought about were structurally changes in the poor-law. Part I. of the 1929 Act was headed "Poor Law," and, as is now well known, the first step taken by the Act was to abolish the boards of guardians and to transfer the functions of all former poor-law authorities to the councils of counties and county boroughs. When, therefore, any attempt is made to explore the present powers and duties of local authorities for the provision of accommodation for the sick, there are three questions to be answered. What were the powers and duties of the former poor-law authorities which the Act has transferred? What were the powers and duties which the county and county borough councils already possessed in this matter? And what fresh powers and duties does the Act create? The answer to the first question is that boards of guardians had a general duty towards the sick, expressed in Section 34 of the Poor Law Act of 1927 (now Section 15 of the 1930 Act), "to provide such relief as may be necessary for the lame, impotent, old, blind and such other persons as are poor and not able to work." The guardians could pay for medical or other assistance required by such persons as the result of accident or sudden illness, they could subscribe to hospitals, infirmaries, or other approved institutions receiving such persons; they could deal with maternity cases under their general powers of poor relief, and provision for infectious diseases (with which we are not at present dealing) could be similarly made under those general powers. Guardians, of course, provided workhouses; they could, if necessary, be ordered by the Central Department to provide "workhouse accommodation"—an expression which included hospital or infirmary accommodation. They have in point of fact established a system of sick infirmaries and sick wards in workhouses apart from their normal workhouse accommodation. Thus it comes about that the county and county borough councils take over a nucleus of separate infirmaries (virtually State hospitals), fulfilling a purpose far wider than their original narrow function as workhouses in the Elizabethan sense. These infirmaries not only supplemented the voluntary hospitals, they have also filled the gap where no voluntary hospital existed. The future working of the voluntary hospitals alongside these rate-aided institutions and the avoidance of wasteful competition or overlapping are objects which the Special Committee of the King's Fund is particularly concerned to promote.

The second and third questions may be answered together. Outside London, as Mr. TRUSTRAM EVE observes, county borough councils, borough councils, and urban and rural district councils have the power (but not the duty) to provide for the use of the inhabitants of their districts "hospitals or temporary places for the reception of the sick." They could build hospitals themselves in their own or in other authorities' districts; they could contract for hospital accommodation or combine with other councils for a common hospital; and they could make reasonable subscriptions, not exceeding a penny rate, to voluntary hospitals by virtue of Section 64 of the Public Health Act of 1925. County councils (including the L.C.C.) had no power to provide hospital accommodation for ordinary illness or to subscribe to voluntary hospitals until Section 14 of the 1929 Act made this possible. The county council is now brought into line with the other local authorities already mentioned; the limit of a penny rate is increased by 33⅓ per cent. under Section 75 of the 1929 Act. Meanwhile the county borough, borough and district councils continue to exercise their functions in this matter as before; they continue also to exercise (with departmental sanction) the power to provide a temporary supply of medicine and assistance to poorer inhabitants under Section 133 of the Public Health Act of 1875—a power still denied to county councils. In London the metropolitan borough councils similarly continue to use their powers under Sections 75 and 77 of the Public Health (London) Act of 1891, unaffected by the 1929 Act, or by the fact that the 1929 Act gives similar powers now to the London County Council. The result of the transfer of poor-law functions is that county and county borough councils now possess alternative powers—powers which can be exercised as poor-law functions or as public health functions. The administrative schemes under the 1929 Act, according to Section 5 thereof, are expected to declare that various statutory forms of public assistance shall be made available exclusively under the statutes concerned rather than by way of poor relief. As Mr. TRUSTRAM EVE says, without a study of the administrative scheme it is impossible to appreciate the methods to be adopted byt he local authority in providing hospital accommodation.

One might add that the medical profession will also be considerably affected by the administrative arrangements whereby the local authority may delegate specific functions to committees and subcommittees. The thrusting of immense tasks of local government and public health over wide areas upon county and county borough councils will strain the machinery unless the main bodies are relieved by committees of much of their work. Committees and subcommittees will presumably have to deal with such matters as the general provision and management of hospitals and local medical services, the staffing and residential arrangements of hospitals, discipline and patients' complaints, medical education and training, and facilities for research. Much will turn upon the experience and outlook of the committeemen to whom these matters are entrusted. There remains another vital task of negotiation. Under Section 13 of the Local Government Act of 1929 (now replaced by Section 8 of the Poor Law Act of 1930), before the local authorities make their final arrangements they must consult "with such committee or other body as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing

services in or for the benefit of the county or county borough as to the accommodation to be provided, and as to the purpose for which it is to be used." The intention of Parliament is clear enough, but the fulfilment will be far from simple.

AMPUTATIONS AND ARTIFICIAL LIMBS.

A VALUABLE feature of the discussion on amputations and their relation to the artificial limb reported on p. 807 was the opportunity given to surgeons and limb-makers to exchange views upon their common task. Patients were also present, chosen to illustrate how by combined efforts a limbless man could be made comfortable in his appliance while regaining much of his former mobility and force. It was stated that in this country 50,000 people had limbs amputated as the result of the war, and the knowledge gained by surgeon and limb-maker in the handling of this crippled and maimed population has resulted in a revision of values. In the early days of the war most of the well-known classical amputations were accepted as standard operations, and none seemed more secure of its place than Syme's amputation. But now that more than ten years have elapsed since the conclusion of hostilities, the time is ripe for an assessment of end-results.

One outcome of the experience which has been gained is that an end-bearing stump in the lower limb is regarded unfavourably. Mr. MAX PAGE, who introduced the discussion, said that those who had seen numbers of cases would agree in condemning Syme's amputation, since a large proportion of these stumps did not bear the test of time, and in any case could only be fitted with a clumsy prosthesis. He had seen many Syme's amputations which had given good service, but had been obliged to reamputate others which were painful and had no functional value. Mr. JENNER VERRALL, from his experience at Roehampton, also condemned the Syme's amputation, as did Mr. LANGDALE-KELHAM. The end-bearing thigh stump, such as the Stokes-Gritti, was also deemed undesirable, but was said to be still popular in America, Canada, and Germany. In below-knee amputations, the most satisfactory stump was agreed to be one preserving 6 or 7 inches of the tibia, although even with 4 inches control of the knee could be obtained. For above-knee amputations, section of the femur about 4 or 6 inches above the level of the knee-joint seemed to give the best functional results when an ischial-bearing prosthesis was fitted. Mr. MAX PAGE deprecated the custom of pulling on the nerves at operation and cutting them high up because of the danger of post-operative pain. It was best to crush and cut them about an inch above the level of bone section and inject absolute alcohol into the nerve-ending. Some surgeons, when amputating through the thigh, inject absolute alcohol into the sciatic nerve at an early stage, thereby producing a nerve block which diminishes the operative shock as well as lessening the prospect of post-operative pain. Emphasis was laid on the necessity of maintaining good tone in the muscles of the stump during the convalescent period and of avoiding joint contracture. It is obviously easier to fit a purposeful artificial limb to a stump with well-functioning muscles than to one with poor muscular control. During the war period considerable attention was paid to the cinematic amputations of Vanghetti, where muscles and tendons were more directly employed in the manipulation of appliances, but apparently this type of operation is now seldom performed, either because the results are uncertain or because of improvements in the artificial limb. There can be no doubt that for the successful reconditioning of a man with an amputated limb there must be complete coöperation between patient, surgeon, and limb-maker. Captain A. R. MAXWELL, who took part in the discussion, stressed this team spirit and added that "A stump might be surgically good but prosthetically bad; but if it was prosthetically good it could not be surgically bad." Each patient presents a peculiar problem; if the surgeon plans the amputation to accord with the prosthesis to be fitted, and the patient coöperates with goodwill, success should be assured. Captain MAXWELL in his own person provides an example of successful team-work; he has an artificial left arm, and although the stump is less than 3 inches long yet he can dig, plough, and use tools for wood and metal work.

The discussion has served a useful purpose in placing before the profession authoritative views upon amputations and their relation to the artificial limb founded on prolonged experience. If regret is felt that certain time-honoured amputations have failed to maintain their traditional place in surgery, it must be remembered that this failure is only in response to technical requirements far more exacting than those formerly made. The artificial limb has been improved out of all recognition in mechanical detail and in convenience. Only those who have to wear an artificial limb know the great comfort of a light appliance, and the light metals have provided the makers with material for a strong limb of little weight. Until the war the question of amputations was largely academic; surgeon and limb-maker worked in isolation, and little progress resulted. Indeed on the continent a type of artificial limb frequently fitted was of the same pattern as that originally designed by AMBROISE PARÉ in the sixteenth century. The advance made during the last dozen years or so in treating the limbless and providing for their comfort and usefulness is man fest

CONTROL OF MEASLES.

MEASLES, whooping-cough, and diphtheria head the list of lethal acute specific infections of young children. Diphtheria ranks third and may, if the community so desires, virtually cease to rank at all; an efficient method of prevention is available for the asking. Of measles it might almost be said that it is one disease for the rich and another for the poor. Measles in the nursery entails as a rule a few days of discomfort and confinement, made up for by a subsequent enlargement of liberty at the seaside. Measles in the tenement house or slum dwelling is very different. The biennial epidemics in the great industrial centres result in the loss of many lives of young children (witness the Registrar-General's weekly return just now) and in permanent damage to an unknown but certainly very great number more. In a recent study reported to the Medical Research Council (Special Report No. 120) J. L. HALLIDAY established some important facts in the epidemiology of measles. He found quite definitely that in the tenements selected (in Glasgow) children were exposed to measles at the earlier ages of life, the period when the case fatality is highest. Although throughout Great Britain measles is essentially a disease of childhood, the period of child life in which an attack takes place varies. Among crowded tenement quarters the disease mainly attacks children under school age; in working- and middle-class families, who live in houses of the single-entry type, the disease is predominantly one of scholars from the age of

5 to 10 years. Among the public school class the age of incidence seems to be postponed to a still later period of school life. A. I. SIMEY [1] regards it as an unfortunate result of the present precautions taken to prevent the introduction of infectious disease into boarding schools that a great number of boys pass through private schools without having contracted measles. Similar precautions in the public schools lead at length to a really great and serious epidemic involving overcrowding of the school sanatoriums; as a result of which complications arise which, in his experience at Rugby, turned an epidemic into a nightmare. G. E. FRIEND, from his experience at Christ's Hospital, finds that the isolation of infectious diseases combined with the exclusion from school of known contacts had the result of reducing the number of epidemics, but of increasing the number of boys infected when the epidemic did occur. SIMEY and FRIEND would thus prefer measles to break out in their semi-isolated communities on a smaller scale at more frequent intervals, and having regard to the age-groups and stamina of the boys under their care no doubt they are right. For the public school probably the best thing is to let measles take its course, little and often. Not so, however, in the tenement, where younger children are concerned. HALLIDAY estimates the case-mortality for ages from 0–2 years as 10 to 20 times greater than for ages from 5–10, and so on in decreasing (but still excessive) ratio for ages up to 5. The reason of course is the greater incidence and fatality of broncho-pneumonia amongst the youngest age-group. What is the nature of this complication we do not know. According to DEBRÉ and JOANNON the virus of measles lowers the threshold for other infections; they regard the broncho-pneumonia of measles as a super-added specific infection. Broncho-pneumonia itself, a disease of the very young under-nourished child living in a crowded sunless environment, is sufficiently bad; as a concomitant of measles it is too often overwhelming.

A measles epidemic arises and attains its maximum incidence with great rapidity. Sir JOHN ROBERTSON, discussing a measles epidemic in Birmingham in 1908–09, showed that before the epidemic there occurred 31 deaths from measles in 20 weeks, during the epidemic period (January–May) 476 deaths in 20 weeks, and in the subsequent 20 weeks, the period of decline of the epidemic, 67 deaths. During an epidemic a large proportion of exposed susceptible children suffer an attack of frank clinical measles. The survivors attain solid active immunity as the result of the clinical attack. But HALLIDAY, from observations in the field, and P. STOCKS and M. N. KARN, as the result of the statistical analysis of the St. Pancras material independently deduced the development by some children during an epidemic of "a partial and probably temporary immunity" (Halliday) or "latent immunisation" (Stocks). Dr. STOCKS has further developed his views of the mechanism of an epidemic in our columns this week, and we commend this paper to careful study. Clearly there occurs during a measles epidemic what S. F. DUDLEY has shown to be the case for diphtheria, an epidemic of immunisation. Whether a child becomes solidly immune as the result of a clinical attack, or partially and temporarily immune, depends upon what DUDLEY calls the velocity of infection. The practical result would appear to be that some exposed children escape clinical attack in the first epidemic. When the next epidemic phase occurs they are in better case to withstand a clinical attack, not only because they are somewhat older, but also because they possess some degree of basal immunity. Unfortunately, it is impossible to control this epidemic of immunisation; in everyday life there is no means of regulating the velocity of infection. Owing to the characteristics of measles in the individual and in the community, notification as a means of control has been found to be of little value. Even if the requisite number of beds were available, and the public could be induced to regard measles sufficiently seriously to make full use of them, it is useless from the point of view of prevention to isolate a case which is only notified when the rash has appeared. At this stage, the maximum phase of infectivity—the catarrhal pre-exanthem or Koplik spots stage—has passed and the damage to the contacts by droplet infection has been done. Much useful curative work can be and is being accomplished in London and several provincial cities by hospital treatment of the severe cases or of those taken from the worst environment. Manchester provides for the notification by the practitioner of the first case occurring in a household; other cities have a system of partial notification through schools. The cases so notified are followed up by health visitors who offer general advice as to precautions to be taken, and sometimes by providing the services of a district nurse and essential nourishment. All such measures, useful as they undoubtedly are, only touch the fringe of the measles problem in industrial areas.

From the laboratory standpoint the position remains much as it was set out in J. E. MCCARTNEY'S review [2] three years ago. But while experimental research languishes, the clinical results of employing adult convalescent serum or whole blood for the attenuation of the disease in exposed susceptible children are being increasingly established on the Continent and in the United States of America. We have recently [3] endorsed the procedure of injecting parental whole blood as one available for the family doctor. In their admirable monograph, from which we have already quoted, DEBRÉ and JOANNON tell us that the serum of adults who have had measles in childhood contains immune bodies not only against measles but against several other infections. DEGKWITZ, in 1920, employed whole blood in 1000 cases. W. H. PARK, of New York, after a rigorous trial lasting 10 years, now advocates [4] the use of parental whole blood. Dr. STOCKS, from a profound knowledge of epidemic measles in a London borough, believes that even without isolating the virus we ought to be able to devise some simple method of partial and temporary protection which would prevent the distressing features of the biennial epidemic. It is clear that except under special circumstances, where even a modified attack of the disease is contra-indicated, sero-attenuation—which results in a lasting active immunity—is preferable to sero-prevention, which confers passive immunity valid for a month at most. The basic causes of the high mortality of young children from measles are doubtless to be sought in poverty, in an improper dietary deficient in vitamins, and in overcrowded sunless dwellings. These conditions must be ameliorated. But that will take time and meanwhile it is certain that sero-attenuation amongst susceptible contacts will save many lives. The children in the family most likely to

[1] THE LANCET, 1926, ii., 1057.

[2] THE LANCET, 1927, i., 92. [3] Ibid., March 8th, p. 519.
[4] Med. Officer, March 1st, 1930.

be attacked first are those of school age. Notification of the occurrence of measles amongst these might with advantage be followed by the prompt injection of those members of the family below school age, the aim being not prevention but attenuation.

Annotations.

"Ne quid nimis."

ECONOMICS OF TUBERCULOSIS COLONIES.

AT the annual conference of the Tuberculosis Association, held in Oxford last week, a report of which will be found on p. 804, a session was devoted to a consideration of the tuberculosis colony and village settlement. The day has gone by when these institutions had to justify their existence on medical or sociological grounds. Almost every Continental text-book on the antituberculosis campaign contains an account of Papworth, and it is the proud boast of that pioneer colony that no child born and brought up in the village has so far developed tuberculosis, though born of tuberculous parent or parents. The products of the various industries from village settlements have further demonstrated a high degree of skill and workmanship. But a tuberculosis colony like every other institution nowadays must either pay its way or give good reasons why it does not. Dr. Bardswell puts the matter tersely at Oxford when he asked "Why has no public authority undertaken a settlement?" Various specious answers could be supplied to this question. Public authorities in this country do not make pioneer efforts, nor have they been charged with possessing imagination. But Dr. Bardswell himself supplied the true one: "The financial position has never been clearly put before them." Writing in 1924, Dr. F. N. Kay Menzies said: "I am not in a position to give you any accurate figures with regard to either the Papworth or Preston Hall Settlements, but it is probably fair to say that the capital expenditure in each case is not less than £250,000. Apart, therefore, from the heavy annual cost of maintenance, it is difficult to see how the erection of a number of such settlements by local authorities could be justified as a practical proposition." This statement has found its way into at least one American text-book, but we are not aware that it has ever been verified or disproved by accountant's figures. The colony has hitherto been widely regarded as a luxurious and expensive method of dealing with the problem of tuberculosis and one which no public authority can face. As Dr. McDougall, medical director of the British Legion Village at Preston Hall, said at the conference the failure to put the financial facts before the public had done more than anything else to discourage the progress of village settlements.

The facts as he gave them are these. When the British Legion took over Preston Hall in 1925 the total initial capital expenditure, as estimated by a competent firm of valuers, was £38,970. Since that date money has been spent on developments which bring the capital outlay up to a round figure of £100,000. Dr. McDougall emphasised the importance of making the financial returns of a colony under the three separate headings of sanatorium, estate, and industries. Only in this way can the financial position be properly understood. In the sanatorium section at Preston Hall the accommodation has been provided at a cost of about £178 a bed, which, even when allowance is made for the fact that much of it consists of hostels and huts, is exceptionally low. On the maintenance side, Preston Hall has been able, in spite of the inevitable fluctuations of the bed list, to preserve a financial balance by charging local authorities £2 12*s.* 6*d.* a patient per week. In 1927–28 there was a profit of £105 and in 1928–29 one of £195. In the estate section the average cost per settler's house has been approximately £103, and these houses are let at rentals varying from 4*s.* to 9*s.* per week inclusive of rates. Portions of the estate are also let to local farmers. The excess of income over expenditure on this section for the four years under review has been £978. In the industries section the total capital expenditure has been £17,544. At the moment, 145 settlers are earning their living at Preston Hall. The total sales during the four years period have realised £198,024; salaries, wages, and commission amounted to £66,160. The balance-sheet of this section shows an average loss per annum of £1080, or 1·8 per cent. on the turn-over. That is an average loss of £11 7*s.* 4*d.* a year per settler since the British Legion assumed control of the enterprise.

In our last issue Dr. E. L. Sandiland, medical superintendent of the East Lancashire Tuberculosis Colony at Barrowmore Hall, gave some figures illustrating the employment of ex-tuberculous patients in colonies, and showed that the breakdowns and time lost by the workers—2·2 per cent.—compared favourably with those in other communities. In spite of this, the colony has not yet reached the stages of a satisfactory balance. The last annual report of the colony states that there were then 25 settlers employed with a net loss in the industries section of £2479 18*s.* 8*d.* The Preston Hall figures suggest, however, that a loss in the industries section may be made up for by a profit in the sanatorium section, although at the moment there are no materials for a strict comparison between the losses on industries in one colony and those in another. Probably one of the advances likely to be made in the near future will be some agreed comparable system of keeping accounts. As time goes on, also, the size of a village settlement will presumably be adapted to the economic problem of the area it serves. Here the spade work done during the experimental years should prove invaluable. Dr. McDougall proposes accommodation for 200 patients in the sanatorium and 50 settlers in the industries section, and if such a ratio as this were found workable the hope of making ends meet with even a small margin for contingencies would be brought one step nearer. Be this as it may, it seems hardly fair at the moment to saddle the village settlements with all the responsibility of their deficits. Apart from the inestimable value of their work on the medical and sociological side, they contribute perhaps more than is realised to the relief of the burden of public authorities. Thus, Dr. McDougall pointed out that at Preston Hall one authority had at the present time 27 ex-patients in residence as settlers and the financial saving to that particular authority must be considerable. Again, there must be many tuberculous patients receiving more per annum from approved societies and disablement benefit than would be necessary to keep them at work as productive units in a settlement. And finally, the colony industries maintain their workers through bad times and good, and when, as recently at Preston Hall, untoward circumstances, such as a fire or breakdown in the works, throw the workers out of employment, they are not forthwith placed upon the dole, as they would be in many industries, but their maintenance is accepted as part of the liability of the industry. From the taxpayer's point of view, then, the colony is a better contribution to the tuberculosis problem than is often supposed. Colony finance has been described as robbing Peter to pay Paul; but Paul may prefer to be robbed by subsidising a man who can retain his self-respect by working four hours a day rather than by leaving him to be entirely unproductive. The immediate difficulties—namely, the capital cost of the settlement and the small percentage of the tuberculous population who are fit to avail themselves of its help—are enough to prevent public authorities from spending ratepayers' money in this way, but there seems no reason why the colonies, which are voluntary institutions, should not receive subsidies in proportion to the extent to which they relieve public authorities of their statutory obligations.

HEATING AND VENTILATION IN SCHOOLS.

IN the severe weather of last year a number of elementary schools had to be closed on account of insufficient heating. This strange fact and others mentioned in the annual reports of school medical officers now coming in suggest that the problem of heating and ventilation in our school buildings is not yet completely solved. The first consideration in arranging a system of heating and ventilation must, of course, be the effect on the health of the school-children, although the cost of the method should not be unreasonably high. Complete guidance is not yet available but the introduction of the kata-thermometer by Leonard Hill has made it possible to assess the condition of the air in schools in respect of warmth, humidity, and cooling power, of which up-to-date authorities like those of Torquay have not been slow to take advantage. Another source of information is to be found in an inquiry [1] just completed by the Industrial Health Research Board which deals more particularly with the comfort and efficiency of the pupils, and how these were affected by the cooling power of the air and the distribution of the heat, especially vertically. In this study the temperature of the head, hands, and feet were measured by an extremely sensitive Moll thermopile. It is generally recognised that for health and comfort the head should not be warm and the feet cold; in one of their experiments Dr. Vernon and Dr. Bedford show a 12 per cent. loss of manual dexterity when the hands were too cold. Two recent methods of heating were found to be good; one, the warmed floor plan introduced by Mr. G. H. Widdows in the Derbyshire schools, the other the so-called panel system. The former recalls the old Roman hypocaust system, but in the new system the pipes contain water under low pressure, whereas the Romans used hot air; the latter method has large cast-iron panels placed near the ceiling also heated by circulating water. With the panel system the temperature of the room at all levels is nearly uniform; with the under-floor pipes the feet are kept warmer than the head, giving a greater sensation of comfort. The panel system has the special merit that the heating is almost wholly radiant, while in most others, including the under-floor plan, it is largely effected by convection.

Comparative estimates of the health of the children under the two systems were not made directly in this research. Something might be gleaned from the records of absenteeism in cold weather, which were much higher in the less warmed schools, but, as the authors point out, the children were usually kept away not by ill-health but by the restraining action of their parents. The investigators were concerned with open-air and other schools; they hoped to apply the information to factory life, but they realise that the conditions are not strictly comparable. In open-air schools warmth is less important than fresh air and light; great benefit has accrued to weakly children in schools with little means of providing artificial heat, and at Hayling Island the heating has been reduced to the simplest imaginable form of coke braziers on the beach. The report states:

"Observations on the hand temperature of 117 children attending three practically unheated open-air schools showed that at two of them the temperatures were about 5° higher than those shown by children in artificially heated schools at equal cooling powers. Probably this was due to the fact that the children were specially fed, were warmly clothed, and they sat at work for short periods only, alternating with periods of physical exercise. By means of canvas blinds the cooling power of the air at open-air schools can be reduced to less than half that experienced in unprotected sheds. Nevertheless, the efficiency of the children, in very cold weather, is only about half that of children in heated schools."

In factories an even distribution of heat is essential for mental and manual efficiency and the fact that the floor may be largely covered by machinery would rule out the under-floor system. For schools, the authors are inclined to think that the panel system is preferable to floor-heating except for open-air schools, but neither system is free from defect unless it embraces a small amount of hot-water radiators or pipe heating in addition to deal with the cold air from large windows. Useful rules suggested for the working of the heating (and associated ventilation) are that the temperature should not fall below 60° F. (or 55° as an absolute minimum) and the air never have a cooling power above 9°.

[1] A Study of Heating and Ventilation in Schools. By H. M. Vernon, M.D., and T. Bedford, Ph.D., assisted by C. G. Warner, B.Sc. Report No. 58. H.M. Stationery Office. Pp. 72. 2s. 6d.

HEALTH INVENTORY OF NEW YORK.

THE Welfare Council of New York have issued a 400-page volume on the machinery that has been developed to promote the health of New York's six million citizens. The report is written by Dr. Michael M. Davis, now director of medical services for the Rosenwald Foundation at Chicago, and Mary C. Jarrett, formerly chief of social service at the Boston Psychopathic Hospital, and has been prepared with the coöperation of 300 organisations (including the municipal department) engaged in health work in the five boroughs which make up New York. New York will learn for the first time its needs for health services, and how these needs are being met, and no doubt the future of health work in the city will be influenced by the facts disclosed. These health services are rendered mainly by clinics, by the home visiting of health nurses and social workers, by various publicity agencies, and by hospitals and convalescent homes, which engage in preventive as well as curative work. There are 818 health clinics in the city (excluding those engaged in curative work), and of these 68·3 per cent. are maintained by privately supported health agencies, 17·5 per cent. by the municipality, and 14·2 per cent. by other official agencies. The 160 clinics which deal with the pre-school child, mental hygiene, heart disease, and cancer are all voluntary institutions. Dental, venereal, maternity, and eye clinics are mainly private agencies. Only in the field of infant welfare does the municipality maintain more clinics than the privately financed agencies. The municipality, however, has accomplished a great work in the coördination of the agencies dealing with tuberculosis. Out of about 2,000,000 home visits made by health agencies, 800,000 were paid by health department nurses. It is estimated that 2,000,000 dollars are spent in clinic services, and 2,000,000 in home nursing services annually, and it is thought that New York spends less per head in this manner than other large cities in the U.S.A. It is also estimated in the report that for every dollar spent in this prevention work, 18 dollars are spent in curative work.

In a preface to the report Mr. William Hodson, the executive director of the Council, and Dr. Neva R. Deardorff, director of its research bureau, show that this study has been made possible by grants from the Rockefeller Foundation and the Commonwealth Fund, and that it has been arranged in such a way as to parallel the inquiry made into the work of the municipal health department in 1926 by the American Public Health Association. They point out that the inventory is primarily a quantitative description of existing health services, and that no attempt has been made to study and deal with the quality or effectiveness of the service. Dr. C.-E. A. Winslow, head of the public health department at Yale University, contributes an interesting foreword. The inventory, he says, makes it clear that the machinery provided is still insignificant in comparison with the real needs, and that the voluntary agencies in particular have been developed with little reference to local needs. The great needs for the future are better provision for pre-school and school-children, and improved quality in infant welfare work. A grave shortage of hospital and sanatorium beds is a striking defect in the tuberculosis programme. The important rôle played by the hospital in the

development of clinic services of a preventive nature is highly significant. In nearly all fields coördination and standardisation of records and practices is called for, and there is an obvious opportunity to proceed further in the direction of generalised home visitation by a single district visitor in each neighbourhood. Dr. Winslow believes that future developments are likely to involve constructive leadership by the health department of a group of coöperative voluntary agencies rather than complete absorption of such activities in a tax-supported programme.

RELIEF OF BLINDNESS IN INDIA.

We print on p. 832 a letter from Lieut.-Colonel R. E. Wright I.M.S., professor of ophthalmology in the Madras Medical College, expressing a fear lest the leading article in our issue of Dec. 21st, 1929 (p. 1315), may create an incorrect impression concerning the relief of blindness and the teaching of ophthalmology in India. We are aware that the teaching of this subject in the large medical schools in India is now good; at Madras in particular the teaching is of a high order, for Madras has one of the finest eye hospitals in the world, and the University there has established a licence in ophthalmology while special ophthalmological centres have been started at other medical schools in the province and at Calicut. No doubt good work is being done elsewhere too; we mention Madras as detailed information happens to be available. The well-known work done in the past and still going on in the various Government hospitals and in other institutions did not come within the scope of our article, but it may be remarked that in the Madras Government Eye Hospital nearly 4000 in-patients and over 25,000 out-patients were treated during 1928. There, as in other centres, the number of in-patients was limited by the available supply of beds, and the total number of cases seen at Government hospitals and dispensaries alone must be enormous, irrespective of the other agencies. What we were trying to emphasise was that there is room for improvement in the treatment of trachoma, at least among the older medical men in India, and especially those who work in outlying dispensaries. Many of the latter are of the subassistant surgeon class, who in past years at least had a shorter course of training than the ordinary medical man, either in India or in Europe. The statement that the teaching in the ordinary medical curriculum in India (as in Europe) was scanty referred to the past, and an allusion to "refresher" classes in trachoma, given to qualified medical men practising in trachoma districts in Austria before the war, was coupled with the admission that the standard of teaching in ophthalmology in that country was high, expressly to avoid giving the impression that by suggesting such a course we were casting a slur on the present workers in India. Even in Madras, however, Colonel Wright himself has admitted that there is room for improvement in the treatment of trachoma.

"We try," he says,[1] "to impress on the students and post-graduates the undesirability of making a diagnosis of 'granular lids' because there is a liability for anything and everything to be diagnosed as granular lids by the average doctor and even by those with special training in ophthalmology. The result of this is that throughout the districts the more energetic forms of trachoma treatment such as rolling, grattage, and the application of strong irritant remedies is freely indulged in, in the treatment of cases which would probably get well if left alone or treated by some milder and non-irritating remedies."

In certain parts of India at least the actual treatment of trachoma, even when correctly diagnosed, is capable of improvement in may cases, judging by the results seen. It is still the cause of much blindness and defective sight, and a well-planned "refresher" course, or any other practicable method of improving the treatment, would be of inestimable value to the people of India. The diagnosis of trachoma involves an exact knowledge of conditions which may be mistaken for it.

[1] Report of the Government Ophthalmic Hospital, Madras, 1928, p. 17.

FRESH LIGHT ON INQUEST PROCEDURE.

THE considered judgment in Rex *v.* Divine, *ex parte* Walton, delivered by the King's Bench judges on March 17th, is the most important pronouncement on inquest procedure for many years. The office of coroner is marked by ancient traditions which Parliament has never completely standardised. The big Act of 1887, replacing a series of statutes going back as far as the thirteenth century, contained an express saving for "established jurisdiction, practice or procedure or existing usage," but this saving clause is naturally difficult to interpret, especially in view of local diversity of practice. For example, when a coroner has recorded the evidence of witnesses, must he read his notes over to them before they sign? Many coroners adopt this precaution, but the recent judgment in Rex *v.* Divine declares that they need not do so. If a coroner thinks there is uncertainty as to what the witness has said, or if the witness requests it, the coroner ought to read over the deposition and the witness may be justified in declining to sign until it is so read to him. But the statutory requirement, set out in Section 4 (2) of the 1887 Act, merely directs that the deposition be signed by the coroner and the witness, and the judges have now pointed out that to insist on any further requirement would be adding something beyond what Parliament enacted. Again, need a coroner, when permitting a jury to view some object outside the court (such as a damaged motor vehicle), allow the parties to be present whose conduct is in issue? The judges now rule that he is not obliged to give the parties this opportunity; the matter is one for his discretion. Should the coroner accompany the jurors on these occasions? The judges say he is not doing wrong if he goes with them, but it is "probably better that he should not." If he does go, he must be careful to abstain from discussion. The principle is that, when evidence has been given in open court, it is entirely wrong that further evidence should be given informally outside the court, or that anyone (even the coroner himself) should join with the jury in the discussions preliminary to their verdict. In Rex *v.* Divine, a review of proceedings at an inquest in Hull (already described in THE LANCET, Feb. 22nd, p. 426), a police constable, who had already given evidence in open court, joined the jury in their inspection and pointed out to them certain matters which apparently had a crucial influence on their decision that the motorist must have been travelling at a high speed. This, say the judges, was most improper. This important information should not have been given outside the court; the incident was good ground for quashing the inquisition. The judges' opinion here, however, seems to justify the comment that, if (as is a not uncommon practice in all courts) a jury is allowed to inspect some object or place outside the court, the coroner should accompany them, although the judges have said that it is probably better that he should not. Somebody must accompany the jury on these occasions; unless the coroner goes himself he cannot be satisfied that additional informal evidence or argument is not being surreptitiously conveyed to them.

An instructive passage in the judgment concerns the selecting of a coroner's jury. It appears that at Hull—as indeed probably elsewhere—there is a practice of using a severely limited panel of jurors for inquest. Eleven jurors were summoned out of a total panel of only 16 or 17 persons. This practice, in a great city like Hull, the judges describe as very objectionable. The principle of the jury system, they say, is the determination of facts by persons taken at haphazard from the body of qualified persons; it is a breach of that system to have a small panel of "regular jurymen." The judges could not definitely declare the system of summoning jurors at Hull to be illegal. No Act of Parliament requires the coroner to have recourse to persons on the voters list from which other

kinds of jurymen are drawn; the selection of a coroner's jury is largely in the coroner's discretion. Section 52 of the Juries Act of 1825 authorised coroners to continue to choose their jurors as theretofore accustomed. Indeed in itself the practice of using a limited list of jurymen is not necessarily reprehensible. The great Lord Mansfield, when laying down the broad lines of our mercantile law, is said to have relied habitually on certain merchants of proved aptitude and experience as his special jurymen at the Guildhall. Coroners' juries, as Hawkins J. once observed, must be brought together in haste and therefore cannot be summoned in the normal leisurely manner. The recent judgment is, however, a broad hint to coroners not to let their officers summon on every occasion the same handful of familiars. In this connexion the judges had to consider another point in the Hull proceedings. The coroner had, before the inquest, gone to view the damaged vehicle with a man who was one of the "regular jurymen" and was subsequently the foreman of the jury. The judges accepted the coroner's statement that no discussion of the causes or circumstances of the accident then took place, but they declare the incident to have been an irregularity which would technically have been "misconduct" even at common law and which justified the quashing of the inquisition as a course "necessary or desirable in the interests of justice" within the extended powers of the High Court under Section 19 of the amending Act of 1925.

It was not really needful that the High Court should have examined into the several matters of alleged irregularity in the Hull proceedings. Fresh evidence had become available since the original inquest had been held, and on this ground alone the High Court decided (a month earlier) that a new inquest should be held. No reflection was made upon Dr. John Divine, the coroner for the city and county of Kingston-on-Hull; an attack upon his summing-up was held not to have been substantiated. Having become aware of the allegations of irregularity, the High Court had to take notice of them; thus, after summarily ordering a new inquest on the ground of the fresh evidence available, the judges took time to consider the other aspects of the case in the postponed judgment lately delivered. There is no need to dwell further upon the ancient and peculiar usages of the coroner's inquest, the wider terms of the oath administered to the coroner's jury, or the other matters which differentiate the inquest from the ordinary forms of criminal procedure. Clearly, any practices which damage the credit of the inquest as a judicial tribunal either in the eyes of the High Court or in public opinion will, if persisted in, challenge the continued existence of the office of coroner. A practice may not be forbidden by statute and yet may be open to considerable objection.

LIVESTOCK IMPROVEMENT.

Prof. F. A. E. Crew, addressing the Royal Society of Arts on April 9th, stated that the lag between demonstrated scientific fact and its incorporation into practice was usually about 20 to 50 years. It is, he said, of the first importance that genetical methods with a scientific foundation should be applied to livestock as quickly as possible if the country is to recover from the present depression in agriculture. A number of factors combine to hinder the development of comprehensive breeding schemes at present, not the least is the financial insecurity in which agriculturists are involved: they literally have not the capital to attempt new methods. Then, traditional wisdom is not readily shaken by new theories, and breeders will not reconsider lightly their old practices. Prof. Crew emphasised the need for establishing a standard of excellence at which breeding should aim, and this is not a simple matter. Sheep breeding, to take an instance, must aim at the production of good mutton as well as good wool; but the fleece of the more thriving sheep is not necessarily the best in the wool market; it is important to decide what qualities must receive primary consideration. The habitat will also demand variations in the ideal type. Ignorance among the stock-breeders is responsible for many fallacies in present methods. Prof. Crew mentioned "those who sell the quickest growing sows and keep the slowest for further breeding, not knowing that the economical conversion of food into pig is an inherited character, and that the quickest growers are the most economical feeders." These, and similar mistakes, he considers can be avoided by the application of genetical methods by the breeders themselves, but this cannot be accomplished without better education of the breeders. Ability should be rewarded, but not as at the present agricultural shows, where emphasis is too often laid on the wrong points. He thinks that too much weight is given to pedigree and too little to the milk record, the bacon quality, the pulling power, the egg and the fertility records. The waste resulting from existing methods is not easily assessed, but he stated that 40 to 50 per cent. of all mares put to the stallion each year fail to produce a foal, and that about 50 per cent. of unfertile matings are due to genetic causes; sterility can be bred into a stock, and it is as important to breed for fertility as it is for any other valuable quality, a point too little realised at present. He concluded with some interesting suggestions on the potentialities of laboratory experiments if applied to agricultural stock. Ductless gland therapy might be used to determine the rate and limit of growth, the duration of lactation, the deposition of fat, and other qualities at present obtained only by the slow process of selective breeding. Research which has been carried out successfully on rats and mice promises to give the same valuable results with agricultural stock if the opportunity is forthcoming.

LOCAL SEQUELÆ TO RADIUM TREATMENT.

THE fact that radium has a more lethal effect on malignant cells than on normal ones is now generally assumed to be the basis of the treatment of cancer by this powerful agent. There are many other disorders, however, in which it is sought to profit by the differential action of radium on various types of non-malignant cell. One of the methods of studying the differential action of radium is to make careful observations of the nature of the local sequelæ to its use. Mr. N. Asherson [1] has noted among the 226 patients treated for non-malignant conditions at University College Hospital during the period 1921–28 the following sequelæ: (1) annular (hour-glass) constriction of the vagina; (2) atrophy of the portio vaginalis of the cervix; (3) shortening and stenosis of the vagina; (4) ovarian neuralgia. Up to 1927 the average dose of radium treatment per patient with a non-malignant pelvic condition was 1200–1800 mg.-hours, but during 1927 and 1928 bigger doses (above 2000 mg.-hours) were given in many cases. It was with the advent of these big doses that certain sequelæ came to light, mostly in women over 40. Among more than 200 cases treated with radium during the years 1921–27 annular (hour-glass) constriction of the vagina was not once observed, but it was found in two out of ten cases treated with doses varying from 2500 to 3000 mg.-hours of the element in 1927–28. In both cases this condition, which was detected within three to four months of the treatment, was associated with complete atrophy of the portio vaginalis of the cervix. The mucous membrane of the vagina was normal. The constriction, situated about one inch from the introitus, was apparently a fibrous ring which yielded slightly to firm pressure. Atrophy of the portio vaginalis of the cervix has been frequently noticed by Mr. Asherson in the routine examination of patients followed up. This atrophy may, however, be only apparent, depending on changes in the uterus and vagina. Complete obliteration of the vagina by

[1] Jour. of Obstet. and Gyn. of the Brit. Emp., 1930, xxxvii., 84.

total stenosis and shortening of the vagina has been observed only in inoperable cases of carcinoma of the cervix, never in non-malignant cases, but chronic purulent and adhesive vaginitis have occurred. "Neuralgia" radiating from over both ovarian regions down the inner side of both thighs to the knee was complained of by one patient, whose general abdominal pain had ceased after radium treatment. One radium burn of the vagina was ascribed to the slipping of the radium tube. Mr. Asherson adds that no case of malignant disease has been recorded in a patient subjected to radium treatment for menorrhagia.

An extended experience in examining cases treated by radium has convinced him that the sole therapeutic action of radium—whether in non-malignant or malignant cases—lies in its being a stimulator and producer of fibrous tissue, and he claims that this theory is supported by the sequelæ observed. He suggests that should there be a few malignant cells, as in an early case, a big dose of radium producing much fibrous tissue may strangle all the malignant cells and so bring about a cure. Should some of the cells escape the effects of this fibrous tissue they will multiply and then overcome the fibrous tissue, and when this resistance is finally overcome the growth extends rapidly to its fatal issue. It is curious that in spite of the widespread use of radium the mechanism of its action is still a matter of dispute.

THE ACQUITTAL OF ETHYL PETROL.

WHEN an enterprising firm put on the market of this country a motor spirit containing a small quantity of tetra-ethyl lead, they encountered a considerable body of opposition. Alarm was expressed freely in the press and in Parliament lest the new fuel should liberate, if its use became general, a sufficient quantity of lead to endanger the health of the public, and the popular suspicion thus fostered had the unfortunate result of compelling the manufacturers to cease distribution before the question could be determined scientifically. The Minister of Health set up in April, 1928, a Departmental Committee which published an interim report in July of that year,[1] but their provisional findings, though favourable, were not sufficiently positive and did not attract wide enough publicity to counteract the popular prejudice against ethyl petrol. The final report of the Committee[2] states in the most conclusive terms that the general use of ethyl petrol—we are not concerned in this country with the manufacturing hazard—would involve no danger to public health whatever. Their experiments have proved that the quantities of particulate lead in the atmosphere would not be great enough to endanger the health even of drivers and of policemen on point duty. The ordinary London dweller inhales about one-tenth of a mi ligramme of lead in a day; the lead inhaled even by those most exposed would not exceed twice that quantity and would still be negligible as a source of danger. Moreover, the hazard from exhaust gases and spillage in a well-ventilated garage is equally minute, and even in badly ventilated garages is not serious; probably nothing like as serious as the risk of poisoning from the carbon monoxide which is common to the combustion products of all fuels. Even those whose skin would be constantly exposed to the liquid would undergo no danger, for it caused no ill-effects whatever even when applied continuously to the shaved skins of rabbits for four months. These results agree with those obtained in America, and amount to a discharge of ethyl petrol without a stain on its character, although, to make assurance doubly sure, the Committee recommend that the fuel shall continue to be dyed, that all cans and pumps containing it shall be labelled, and that the amount of lead tetra-ethyl should not exceed 1 part in 1300 by volume or 650 by weight. It remains to be seen whether, with this evidence at their back, manufacturers will reintroduce ethyl petrol. It undoubtedly has certain advantages and seems to harm engines as little as man, though its outstanding merits are chiefly apparent in engines with a much higher compression ratio than those of the ordinary motor vehicle. These are the points of interest to the motorist, but the report contains a wealth of accurate information (summarised on p. 826) on the apparent universality of lead, when sought by delicate tests, and on the processes of absorption and elimination which will engage the attention of the toxicologist and medico-legal expert.

[1] Cmd. 3159.

[2] Ministry of Health: Final Report of the Departmental Committee on Ethyl Petrol. H.M. Stationery Office, Adastral House, Kingsway, London, W.C. Pp. 91. 1s.

THE SAFEGUARDING OF VOLUNTARY ASSOCIATIONS FOR MENTAL WELFARE.

WHEN the Local Government Act, 1929, came into force on the first of this month, the care of mental defectives was handed over to county and county borough councils. In this connexion the Ministry of Health have circulated a three-year scheme whereby the invaluable coöperation of voluntary associations concerned with the welfare of defectives can be retained by the new authorities. The Minister suggests that every Council shall pay two annual contributions—one to the local voluntary association and one to the Central Association for Mental Welfare. The amount of the contributions is prescribed by the schedule, and is to be paid in quarterly instalments. The efficiency of the local associations is made a condition of their grant, and is to be judged by the council who make it, while that of the central association is to be judged by the Minister. Local councils are entitled to inspect the premises and services of the local associations and to receive a copy of the annual report and statement of accounts. Except on the ground of inefficiency, no councils are entitled to terminate or reduce their annual contribution without the consent of the Minister. The contributions to the central association have been based on the Board of Control's direct grant of £2000 for the standard year and apportioned between the various local authorities according to population. By Section 106 of the Act local authorities can request the Minister to pay their contributions direct to the central association and, in view of the obvious inconvenience in collecting small sums quarterly, the Board of Control hope that all local authorities will take this course. The purpose of this scheme is to protect the voluntary associations under the new system; the amounts of the contributions may be varied from time to time, and local authorities can make further contributions if they wish to. The value of the voluntary work carried out in all parts of the country is so indisputable that it is to be hoped that the new organisation will in no way hinder its development.

THE house and library of the Royal Society of Medicine will be closed from Thursday, April 17th, to Tuesday, April 22nd, both days inclusive.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 13th, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 5th. France and Belgium will make the change at the same week-end, Holland on a date in May, while Spain has not definitely decided but will probably not adopt it at all this year.

Mr. Harry Percy Adams, who died on Monday in Westminster Hospital, was a great architect of hospitals. Head of the firm Adams, Holden and Pearson, which designed the new Royal Westminster Ophthalmic Hospital and is executing the large modern hospitals at Constantinople and Malta, he was assessor for the new Birmingham Hospital Centre which produced the admirable design recently printed in our columns. Hospital patients will have reason to remember Mr. Adams with gratitude, for it was he who introduced into this country the lengthwise lay-out of wards which combines comfort with privacy.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXVII.—BACTERIAL BLOOD CULTURES.

In many protozoal infections, such as malaria, parasites appear in the blood in such numbers as to be readily recognisable in a film. Few bacterial blood infections can ever be recognised by this simple technique, although very occasionally, as a terminal event, stained blood films show organisms in such infections as staphylococcal septicæmia. Cultural methods are therefore essential for the effective diagnosis of septicæmic infections in general.

It is generally accepted that the circulating blood of a healthy person is sterile. Organisms must constantly enter the blood stream, but in a state of health the bactericidal power of the blood, and the filtering property of the reticulo-endothelial system, almost instantaneously kill and remove them. It is probable that, even in severe septicæmia little actual multiplication of organisms takes place in the circulating blood. But a "positive" blood culture is usually evidence of a severe generalised infection and bears a correspondingly grave interpretation.

The terms "septicæmia" and "pyæmia" are in common use. There is little real distinction between them. Both imply a deficient bactericidal power of the patient's blood and reticulo-endothelial system; the formation of metastatic abscesses, known as pyæmia, is often a late stage of "septicæmia," and on the whole a sign of satisfactory local reaction. The terms are relics of the early days of bacteriology and will probably be abandoned in the future.

Indications for Blood Culture.

Blood culture is indicated in any case of unexplained pyrexia. Even with our present inadequate methods a surprisingly large number of positive blood cultures would be found if such examinations were more frequently made. The following list suggest certain appropriate cases for this investigation: (1) Patients with valvular lesions of the heart, with a temperature failing to react to salicylates. (2) Patients in the puerperium, with an unexplained temperature over 101° F. persisting more than 48 hours. (3) Patients with skin wounds, however slight, with a temperature over 101° especially if rigors are present. (4) Patients with severe sore-throats and rigors. (5) Patients recovering from surgical operations where a high temperature persists for more than 48 hours and exceeds 101°. (6) Any patient with a rigor, unless there be an obvious explanation (e.g., malaria, serum sickness). (7) Patients suffering from acute infections of the middle ear, including acute mastoiditis. Many patients with rigors, in whom blood cultures are not systematically performed (such as those passing urine per vias naturales after prostatectomy), will be found to give positive blood cultures if examined during the rigor.

It will be noticed that a temperature of 101° has been selected as a crucial one. This does not imply that all patients with this temperature are likely to have septicæmia, but it does imply that until that point is reached and in fact until the temperature reaches 103°, positive results are improbable.

Methods of Culture.

It is essential to recognise that while a positive blood culture is significant, a single negative culture is of no value. Even in severe septicæmia only a very few organisms are present per c.cm. It is therefore necessary to take the cultures under optimal conditions, of which the most important is that the temperature of the patient should be at its height, or on its upward curve. Positive cultures are most likely to be secured, for example, during a rigor. Study of the temperature chart will show that at some period, usually at night, the temperature is highest, and such occasions should be selected. Exceptional cases of septicæmia, usually severe if not fatal, are occasionally encountered in which the patient fails to react at all to the infection and temperature does not rise. But the majority of blood cultures taken in afebrile states are sterile.

The sterilisation of the skin is of great importance. Blood is most readily taken from the median basilic vein and the skin must be thoroughly cleaned with ether and painted with iodine.

The most satisfactory cultures are those taken at the bedside by a pathologist, the blood being directly introduced into the culture media. If this is quite impossible, blood may be taken, either with a syringe sterilised in boiling methylated spirits or by a Wassermann needle, into a sterile tube with a sterilised rubber plug. A tube (the "Behring venule") fitted with a needle, and already sterilised, is on the market, and blood is withdrawn into this through the agency of a partial vacuum. This is quite a satisfactory arrangement for the transmission of blood for culture. Coagulation may be prevented by a trace of potassium oxalate, or a ½ c.cm. of Liquor Trypsin Co. (A. and H.) previously sterilised by filtration. Citrated blood is useless owing to its alkalinity. The blood can then be sent by post for culture, but results are less reliable, if negative, than those in which the blood is directly applied to the culture media. The culture even of blood-clots, however, is often of value, especially in enteric fever and malignant endocarditis.

Not less than 10 c.cm. of blood should be taken at any examination, and it should be sown in a selection of liquid media. Solid media are as a rule useless. It must be stressed that the culture of a few drops of blood from a patient's ear or finger is quite useless. In order to prevent coagulation trypsin solution is of great value. Bile-salts similarly prevent coagulation and are useful in enteric fever and similar diseases, but inhibit the growth of some bacteria. Among the best media are glucose broth and distilled water. Cultures are grown both aerobically and anaerobically, the bulk of medium being always at least five times as great as that of the blood. A positive culture is evidenced by turbidity and change of colour of the medium. Cultures are examined daily, and no culture is deemed sterile until at least 14 days have passed.

Results of Culture.

Contaminated cultures are common, the organisms being derived either from the skin or the air. From the skin staphylococci and diphtheroid bacilli are commonest, and from the air organisms of the subtilis group. Of these only the *staphylococci* present difficulties; if only one tube of a serum contains the organism, and if the organism is of the "albus" type the cultures are usually held to be contaminated. Staphylococcal septicæmia is by no means uncommon, and blood cultures taken in the early stages of acute bone infections consistently give evidence of it. It is also frequently met with in severe infections of the subcutaneous tissues. But it is as well to withhold judgment if no organism other than the staphylococcus is demonstrated. Streptococci, on the other hand, are always to be accepted as evidence of blood stream infection, and are, with the typhoid group, the organisms most commonly found. Influenza bacilli, gonococci, and indeed nearly all recognised pathogenic organisms have at some time been reported, but are all in varying degree exceptional.

The discovery of organisms of the *enteric* group means that the patient has typhoid, or other analogous fever, cultures taken within a week of the onset of symptoms being regularly positive. They are probably the easiest organisms to grow from the blood stream, *B. typhosus* being easier to recover than members of the Salmonella group. Even within the first 48 hours of the illness positive cultures may be obtained, and, contrary to statements sometimes made, positive

cultures are obtainable so long as the temperature is raised; the likelihood of success diminishes after the first 14 days. Negative blood cultures at no time exclude these infections, and the importance of a white cell count, showing leucopenia, and an agglutination test after the first ten days, must not be forgotten.

The growth of *pneumococci* in pneumonia has no important clinical significance beyond confirming the diagnosis. In lobar pneumonia most authorities find that about 30 per cent. of cases give positive blood cultures, and it is suggested that these are more frequently found in the more severe cases. There is no general agreement on the question as to whether lobar pneumonia is a septicæmia which becomes localised, or a pulmonary condition with an overflow into the blood. Pneumococci are also occasionally found in blood cultures of subacute infective endocarditis, and in septicæmias following operation and post-mortem wounds.

Streptococci in the Blood.

The recovery of streptococci from the blood is of the greatest importance, and in a patient with a valvular lesion of the heart almost invariably implies the fatal diagnosis of malignant endocarditis. Few bacteriologists claim to have secured positive blood cultures in simple rheumatic endocarditis. In subacute malignant endocarditis the organism is usually *Streptococcus viridans*, and in the more rapidly fatal cases hæmolytic types are found. A hæmolytic organism therefore bears a worse prognosis. If no valvular lesion is recognised and streptococci are found, the diagnosis is one of septicæmia, and the prognosis again depends to some extent on the nature of the organism, since the hæmolytic strains are as a class the more dangerous. The localisation of infection in deep abscesses should be looked for, and is of good omen; but incisions, whether blood cultures are positive or negative, should never be practised until pus is beyond question present. It is quite common for large swellings to appear and disappear many times before true localisation occurs.

If a hæmolytic streptococcus is present, treatment with antitoxic sera is urgent and essential. There is as yet no final evidence as to the specificity of hæmolytic strains, and in this country the use of scarlet fever antitoxin has been found satisfactory in cases both of puerperal and other streptococcal septicæmias. While intravenous injection is, as a rule, harmless, it always causes rigor, and the intramuscular route is preferable. At least 30 c.cm. should be given in one dose, and up to 100 c.cm. may be given without fear of bad results, and repeated daily. Such heroic doses may appear excessive, but recovery has been observed in apparently hopeless infections when they are employed. In pneumococcal septicæmias therapeutic sera are also available, and in the hands of many authorities have yielded good results. In the rare cases of meningococcal meningitis the appropriate serum should always be used.

In septicæmias other than these there is no indication for specific treatment at present. The use of arsenobenzol derivatives, of mercurochrome and mercuric chloride, to mention only a few suggestions, has been advocated. But at present no satisfactory measures are available. The value of blood transfusion in any case of septicæmia is often very great. Experience suggests that it is desirable to test donors' cells directly against patients' serum, and not to rely on a "universal donor" in cases of septicæmia.

Finally, it may be stressed that at least three attempts should be made to procure a positive blood culture before septicæmia is excluded, and that this is particularly important in malignant endocarditis, where even under the best conditions by no means every case gives a positive result. Patients with chronic valvular lesions may become malingerers, and a succession of negative blood cultures with a high temperature in such patients suggests a careful watch over the taking of temperatures. On the other hand, if blood cultures show, over a period of weeks, a growth of streptococci on repeated examination, particular attention should be paid to the heart as malignant endocarditis becomes, with passage of time, a more and more inevitable diagnosis.

R. J. V. PULVERTAFT, M.B., M.R.C.P.,
Pathologist to the Medical and Surgical Units, St. Thomas's Hospital; Plimmer Research Fellow in Pathology.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. R. W. Nesbitt is promoted to the rank of Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. J. E. L. Morris to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. M. C. Beatty, having attained the age for compulsory retirement, is placed on retd. pay.

Temp. Lt.-Col. T. S. Blackwell to be Lt.-Col., vice Lt.-Col. W. J. Weston (decd.).

Temp. Lt.-Col. H. E. Priestley to be Lt.-Col., vice Lt.-Col. M. C. Beatty, retd. pay.

Maj. and Bt. Lt.-Col. C. M. Drew to be temp. Lt.-Col.

Maj. D. Pottinger retires, receiving a gratuity.

Maj. A. S. Littlejohns to be temp. Lt.-Col.

ARMY RESERVE OF OFFICERS.

The undermentioned, having reached the age limit of liability to recall, cease to belong to the Res. of Off.: Lt.-Col. P. C. Douglass and Maj. J.. M Cuthbert.

TERRITORIAL ARMY.

Maj. H. C. Sands retires on completion of tenure of comd. and retains his rank, with permission to wear the prescribed uniform.

W. F. Dorward (late Cadet, St. Andrews Univ. Contgt., Jun. Div., O.T.C.), E. Hutcheon, and E. J. Fitzgerald to be Lts.

INDIAN MEDICAL SERVICE.

Lt. G. G. M. Davis relinquishes his prob. appt.

The undermentioned officers relinquish their temp. commns.: Capts. K. Ram and S. M. A. Khan.

COLONIAL MEDICAL SERVICES.

The following appointments have been made:—Dr. M. A. Minahan, Lady Medical Officer, Federated Malay States; Dr. W. T. M. Gilbert, Medical Officer, Nigeria; and Dr. T. S. Dalrymple, West African Medical Service.

PAYMENTS TO A MEDICAL STAFF.—In view of the increase in the number of patients since the establishment of a contributory scheme, the board of management of Warrington Infirmary decided that "it is only reasonable and fair that a proportion of the Contributory Fund should be paid over to the members of the medical staff," and the proportion was fixed at 10 per cent. In view, however, of the recent heavy expenditure upon additions and alterations the medical staff decided to return 25 per cent. of their total for 1929. The medical board report that the accommodation is still altogether inadequate.

HOSPITAL WORK IN THE DOMINIONS.—The Volkshospitaal, the nursing home of the Dutch Reformed Church at Cape Town, which has cost £54,000, has recently been formally opened. The ceremony was performed by Princess Alice, Countess of Athlone, who made a speech in Cape Dutch.

The Alberta Medical Caravan is about to begin its annual tour among the lonely farming communities of the Canadian West. The caravan consists of several specially equipped lorries, containing a complete hospital outfit, a dispensary, and a dental clinic, and the personnel is formed of two surgeons, two dentists, and four nurses. Each stopping place is notified in advance, the patients assemble there from the surrounding districts, and the caravan remains until all the patients have been disposed of. Last year more than 4000 examinations were made, 1408 operations were performed, and 4273 dental cases received attention.

Special Articles.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THE JUBILEE CONGRESS.

THE Jubilee Congress of the Society took place on April 3rd, 4th, and 5th, at the house of the Royal Society of Medicine, under the presidency of Mr. LESLIE PATON.

The PRESIDENT presented the Nettleship Medal to Miss Ida Mann for her investigations into the embryology of the eye, commenting on the excellence of her work in this field during the last ten years, and proceeded to deliver his Presidential Address on

SOME OF THE FACTORS CONTROLLING THE POSITION AND MOVEMENTS OF THE EYES.

He dealt mainly with the part played by the labyrinth and the proprioceptive impulses from the neck muscles in the control of the position and movements of the eyes. In man and animals with frontally placed eyes the retinal stimuli had a predominating place in the control of the position and movements of the eyes, and in such animals it was only possible to get good evidence of the importance of other lower dyscritic controls when the higher epicritic retinal controls were either removed or damped down. But the other factors were constantly present and in action, and when their functioning was interfered with important symptoms and signs were produced. The lower controls, as a rule, did not rise to the level of consciousness, and the cerebral cortex was not necessarily involved in the path of their arc. It was different with the retinal control, and, certainly in respect of the visual fibres, this was epicritic.

Mr. Paton described the unceasing control exercised on the position and movements of the eyes by the labryinthine organs and by the reflexes from the movements of the head relative to the trunk. This control was definitely connected with the mechanism for the maintenance of general body equilibrium and of muscle tone, also with that of hearing; and this association produced a complexity of structure in the central nervous system which it was difficult to unravel. He sought to make two points in respect of labyrinthine control: (1) the constant nature of this control; (2) the fact that the basic nature of the end organ involved remained unchanged, structurally and functionally, throughout the animal kingdom; it was throughout a sensory organ, responding to variations in pressure. In all cases the activity of the sensory cells varied inversely with the pressure on them—i.e., the lower the pressure the greater the activity. The reflex connexion of the labyrinths with the eye muscles was obviously a very direct one, but it could also be shown that the effect produced was the result of the summing up of the effects of the two labyrinths, so that when one was destroyed the remaining one only produced half the effect. Mr. Paton proceeded to discuss the functions and connexions of the sacculus and the utriculus, and showed that the maculæ utriculi were linked up with the oblique muscles, and each utriculus was linked up with all four obliques. It was clear, he said, that the utriculus must link up with the superior and inferior recti. When a monkey was placed face downwards, both eyes looked upward; when it was placed on its back, both eyes looked down. He went on to speak of the semi-circular canals and the cristæ ampullæ and their respective functions. He said that the nystagmus which resulted from destruction of a labyrinth lasted only a few days. The labyrinthine control of the position and movements of the eyes was only a small part of the labyrinthine function in maintaining muscle tone and body equilibrium generally. A recognition of the complexity of the problem and of the number of gaps in knowledge might stimulate the filling of these gaps. It was essential to have a better understanding of nystagmus and of some of the more obscure forms of ocular palsy and ocular disturbance.

Delegates from the United States, France, Holland, Spain, Italy, Norway, Sweden, Austria, and Belgium congratulated the Society on the attainment of its Jubilee, and presented an ivory presidential mallet, inscribed in enamel.

Mr. E. TREACHER COLLINS read a paper entitled *The Harderian Gland—Xerophthalmia; Vitamin A Deficiency; Keratomalacia.*

His deductions from the detailed evidence he brought forward were as follows: (1) the eyelids and para-ocular glands had been developed in animals living in an aerial environment to protect their eyes from foreign substances, and to prevent their corneal epithelium from undergoing keratinisation; (2) the lacrymal secretion acted mainly as an irrigating antibacterial fluid; (3) the mucous secretion of the Harderian gland preserved the corneal epithelium from keratinisation in the animals in which it was present; (4) the disappearance of the Harderian gland in primates was compensated for by an increased development of unicellular mucous glands in the retrotarsal folds and ocular conjunctiva; (5) in animals fed on a diet deficient in vitamin A the Harderian glands soon became atrophied and ceased to function, and in the absence of their secretion the epithelium of cornea and conjunctiva showed keratinisation; (6) in human beings on a deficient vitamin A diet the mucous secreting cells of the conjunctiva atrophied, and keratinisation followed; (7) keratinisation might affect the ducts of the lacrymal and meibomian glands, so that they became secondarily involved; (8) in the absence of its mucous secretion the surface tension of the conjunctiva became altered, so that the fatty secretion of the meibomian glands adhered to it, and this secretion formed an excellent medium for micro-organisms; the pathogenic ones excited an inflammatory reaction which, in the cornea, resulted in keratomalacia. Inability to see in a dim light after exposure to a bright light, a symptom frequently met with in association with xerophthalmia, had been produced in rats by a diet deficient in vitamin A, and was found to be accompanied by a marked delay in the regeneration of the visual purple. Further, xerophthalmia was frequently accompanied by pigmentation of the conjunctiva in dark-skinned races of mankind and animals. A 1 per cent. aqueous solution of mucin suitable for application to the eye could be prepared from the desiccated Harderian glands of sheep by the use of sodium hydroxide.

The afternoon sitting on April 3rd was devoted to a discussion on

Disorders of Secretion of the Endocrine Glands Associated with Eye Diseases.

Mr. J. H. FISHER, in opening the discussion, spoke of the complicated interacting mechanisms which controlled the carbohydrate metabolism of the body, and said that in spite of these complexities the ophthalmic surgeon seemed satisfied, when sugar was found in the urine, that he understood the ætiology of the case. In fact many endocrine glands might be playing a part in such a case, and there was great need for the biochemist and physician to come to the aid of the ophthalmologist. Myasthenia gravis had been described in association with hyperplasia of the thymus, with congestive enlargement of the parathyroids, and with exophthalmic goitre. That it might be due to some disturbance of endocrine glands was also suggested by the fact that in women the condition improved if pregnancy occurred. Thyroid extract had been used in its treatment. Osteomalacia attacked both sexes, and in the female was aggravated by pregnancy. Myxœdema was well controlled by organotherapy. This disease did not lead to lens changes; if cataract occurred after excision of the thyroid gland, it was probably due

to simultaneous removal of the parathyroids. The endocrine glands were factories, each turning out its special product which was essential to health. Mr. Fisher suggested that in cases of endocrine disorder the biochemists should investigate to the uttermost the constitution of the blood, from which alone the ductless glands drew their pabulum, and into which they poured their products.

Prof. H. MACLEAN discussed the connexion between glycosuria and eye changes.

Dr. W. CLARK SOUTER, Prof. E. C. DODDS, Mr. A. W. ORMOND, Mr. CHARLES GOULDEN, and Prof. MELLER (Vienna) also spoke.

Among many interesting papers and demonstrations was one by Mr. W. S. DUKE-ELDER, who gave by means of a series of slides some observations on the

Physiological Action of the Extra-Ocular Muscles.

He gave an account of experimental work he had been doing in order to show the effect of choline and acetyl-choline on the extrinsic muscles of the eye. The matter arose, he said, during a research upon the effect of various drugs upon the extra-ocular circulation, when peculiar reactions upon the intra-ocular pressure were registered with choline. The extrinsic muscles of the eye differed from muscles elsewhere in the body because their fibres were exceptionally fine and delicate, and it might be that their permeability was so great, owing to their fineness, that choline could diffuse in them. The reaction which took place with choline was traced to a contraction of the recti and obliques which was unaffected by atropine and was abolished by nicotine and curare. Mr. Duke-Elder pointed out that this reaction corresponded in every way with the phenomena described by Vulpian as occurring in denervated tongue muscle, and by Sherrington in denervated skeletal muscle, where pseudo-motor contraction of this order was obtained either by the stimulation of the sensory or vaso-dilator nerve-supply, or by the injection of choline. This peculiarity in the physiological action of the extrinsic muscles of the eye, that is, behaviour corresponding to that of denervated voluntary muscle elsewhere, was discussed by Mr. Duke-Elder in relation to the peculiarities of the sensory innervation of these muscles, and the curious anatomical features of the muscle-fibres themselves.

Dr. W. R. AYKROYD read a paper on

Functional Night-Blindness due to Vitamin Deficiency.

He said this recurrent difficulty in adapting the eyes to dim lights had been thought to be due to vitamin deficiency for several reasons. It occurred in association with a poor diet, was rapidly curable by giving cod-liver oil or mammalian or bird's liver, and was often noted in conjunction with external eye conditions similar to those produced experimentally in vitamin A-deficient animals. But the ætiology of the disease could not be regarded as established beyond question. He described the following observations made in Newfoundland and Labrador last summer. The diets of a series of cases of hemeralopia were found to be obviously deficient in vitamin A. In some patients the disease developed in less than a month after the patient had passed from a diet rich in vitamin A to one which was almost devoid of it. The conditions of the country, and the mode of life followed by the people made it difficult to obtain food containing vitamin A. All the cases were curable in 24 to 48 hours by one or two doses of cod-liver oil. Two fishermen had cured themselves by eating half a seagull's liver raw. Strong sunlight, however, played a part in the causation of this functional night-blindness; men exposed for long periods to sunshine in open boats were the chief sufferers. Women and children were rarely attacked by it. However, normal people did not develop the condition, whatever their exposure to the sun. In women, hemeralopia was usually associated with pregnancy, and tended to clear up spontaneously. Delay in the regeneration of the visual purple would account for the observed clinical facts. Hippocrates was aware of the "liver cure" for night-blindness. For this particular functional form the term "nutritional dysskotopia" had been suggested.

Mr. FRANK JULER read a paper entitled

Some Cases of Damage to Descemet's Endothelium.

He quoted the words of Friedenwald in his recent book on the pathology of the eye: "The influence of Descemet's membrane on the nutrition of the cornea is entirely unknown, for the membrane and the lining endothelium combine to form a barrier against the passage of fluid and of substances in solution, from the anterior chamber into the cornea. When the endothelium is injured, the barrier becomes imperfect and œdema of the cornea results, which manifests itself (1) in the formation of blebs under the epithelium, (2) in a general milky haze of the cornea, (3) in the development of folds in Descemet's membrane." Mr. Juler's experience supported this statement. He described cases of (1) œdema of the cornea from a fragment of glass free in the anterior chamber, (2) corneal opacity resulting from irrigation of the anterior chamber in process of cataract extraction, (3) epithelial dystrophy of the cornea in two sisters. With regard to the second of these cases, the dangers of irrigation, apart from possible infection, were (1) loss of vitreous, and (2) the use of solutions of incorrect concentration or irritant action. These solutions must not be used too hot or under too great pressure. There was also (3) a danger of damaging the back of the cornea with the nozzle of the irrigator, the latter being especially to be avoided when there was recent damage to the endothelium.

THE GENIUS OF WILLIAM BOWMAN.

The Bowman Lecture was delivered by Sir ARTHUR KEITH, F.R.S., who began by relating an incident which gave an intimate view of Sir William Bowman's personality. James Syme, when Regius Professor of Clinical Surgery at Edinburgh, had publicly condemned the operation of iridectomy for the relief of acute glaucoma in 1857, and Bowman wrote him a personal letter stating that he found it the only certain and indispensable treatment for the condition. He did not himself rush into print, though eventually Syme sent the correspondence to the *British Medical Journal* in which his attack on the operation had appeared. Bowman made brilliant discoveries in anatomy in his youth, and in his full tide he did more than any other man in the domain of ophthalmology. Before he was 25 Bowman had advanced medicine by a series of notable discoveries; he had very rare gifts of mind, and he must have had some missionary quality which urged him on. It was an urgent desire for betterment which probably explained his distinction, yet only rarely could one obtain a glimpse of his motives. In his thirtieth year he delivered a lecture at Moorfields in which, after speaking of the pleasures of the earnest pursuit of knowledge, he referred to cases of blindness caused by inflammation of the cornea, and used these words: "These cases occur amongst the poor, a class to whom the eye is, if possible, even more valuable than to the rich, because without it they can hardly obtain their daily bread or enjoy the common comforts of existence." Later, in a lecture to students, he spoke of a strong yearning for the advancement of knowledge, and said his whole soul was overflowing with a sincere desire to know and to practise whatever was right. He shared fully that humanitarianism which animated so many great Victorians. The master and inspirer of Bowman, said Sir Arthur, was Prof. Robert Bentley Todd, his senior by only seven years, and Bowman shared with Todd the chair of anatomy and physiology, and was never tired of extolling his colleague's merits which seemed indeed to be of a high order. His paper, published in THE LANCET (1842, i., 560), on the appearances revealed by the microscope in a case of fatty degeneration of the liver must have been one of the earliest

—if not the first—in which the microscope was employed to elucidate finer pathological changes. Bowman himself was quite aware he was opening up a new field, and claimed that the condition he had drawn attention to "was an admirable example of the kind and degree of insight into pathological changes which the microscope was calculated to afford." In the course of carrying out his microscopic survey of the glandular system of the body Bowman came to the kidney in or before 1841. He, in 1842, gave us at a single step our modern conception of the organisation of renal structures. For his paper on the structure of muscle he was elected Fellow of the Royal Society at the age of 25 (1841), and for his paper on the structure of the kidney he was given a Royal Medal. Bowman's account of the eye was the modern one—the eye as revealed by sections viewed through a compound microscope. Our conception of the cornea remained much as he left it; the ciliary muscle had no certain existence until he defined its relations, nature, and function, though he supposed that it served accommodation by altering the position, not the form, of the lens. He detected the circular and radial musculature of the iris, though it was left for later workers to amend his conception of the structural elements of that musculature. He saw the optic fibres circle on each side of the "yellow spot" yet dismissed the "spot" as of little importance in vision because it was not present in the eye of the dog, cat, rabbit, and bird—animals with perfect sight. He refused to regard the rods and cones (bulbs) as concerned in perception because they lay on the outer or "wrong" side of the retina. With a flash of insight he speaks of the eye as "a sheet of nervous matter brought towards the surface of the body to meet the appropriate stimulus," and then, in another passage, stated that the relationship between the retina and the "sensorium" was a problem "too inscrutable for our limited powers." Sir Arthur thought it could be said with truth that Bowman made a larger contribution to our knowledge of the anatomy of the eye than any other investigator. He certainly made mistakes, but when allowance was made for the primitive methods then at the disposal of microscopists, and the novelty and vastness of the field in which he laboured, the marvel was that he was so often right.

Sir Arthur touched on what he termed an enigma in Sir William Bowman's life. From his twenty-second to his twenty-sixth year investigations and discoveries followed each other regularly, and then his ardour for discovery, judged by results, seemed to have cooled, though he still added to the resources of medicine and surgery. Still, the last fifty years did not fulfil the promise of his earlier ones. An event of significance at this time was that in 1842 he was happily married, and the lecturer speculated on what might have happened had Bowman, in the full tide of his discoveries, been appointed surgeon to King's College Hospital in place of Sir William Fergusson. He concluded his lecture by drawing attention to the resemblances between Lister and Bowman. Both those great men proved in their first publications that they were not apprentices, but master workmen; both became Fellows of the Royal Society; they had much in common physically and their tastes harmonised; and both had a deeply rooted desire to help the poor and unfortunate. They were equally modest and unassuming. If in the turn which fate gave to Bowman's career general surgery could be said to have suffered, ophthalmic surgery certainly reaped rich reward.

Prof. VAN DER HOEVE read a paper on the

Eye and Amnion Bands.

He said these bands exercised a great influence on the development of the human being and they could cause great damage; they certainly were responsible for facial and other disfigurements, and might even cause amputation of limbs. In some cases such a band extended from the eye to the mouth, distorting both. He projected some pictures of patients so affected and showed that much could be done to improve the appearance in some victims.

Mr. AFFLECK GREEVES read a paper on

X Ray Applications in Superficial Keratitis.

He showed that in cases of acne rosacea, a very painful condition with ulcers of the cornea and scarring, X rays produced a lessening of the pain and the photophobia. Often a single application of the rays brought great relief. The same measure gave good results in recurrent abrasions of the cornea, causing immediate and rapid healing. He was unable to record successes by this means in cases of Mooren's ulcer, though some of these patients reported diminution of pain. Neither did the rays cause marked improvement in bullous keratitis.

Mr. J. W. TUDOR THOMAS gave the results to date of a long investigation into the possibilities of

Transplantation of the Cornea.

He brought for exhibition four rabbits in which he had succeeded in producing clear corneal grafts. He said that transplantation of corneal tissue was first attempted 107 years ago, since which date many attempts had been made, but, so far, no really satisfactory operative procedure had been established. The sixth of a series of methods tried had provided good results. This consisted of the taking from the margin of the cornea of a graft of triangular or quadrilateral shape and uniting it to the cornea by cross-stitches, a wide iridectomy being performed so as to prevent the iris from adhering to the graft. Fourteen rabbits were operated upon in this way. In 13 of them the grafts became united. Two were quite transparent at three and four months respectively. Even better results were obtained when the grafts were circular. The various stages of the research were clearly shown by photographs of the rabbits exhibited on the screen. Mr. Tudor Thomas said that the grafts must be manipulated with great care and must not be grasped by forceps or other instruments. Olive oil should be used to lubricate any instrument which might come in contact with the graft, and the latter should be placed in sterile olive oil before placing it in the gap prepared for its reception. The margins of the graft should be cut in a shelving manner; it should be round, so that there were no corners to become detached and protrude. Partial detachment produced opacity, which usually affected the whole graft, as also did adhesion between the iris and the graft. Cross-stitching seemed to overcome most of the difficulties. He proposed to continue this work as it was far from complete. He intended to defer trying the method on a human patient until he had obtained more exact information from his experiments on rabbits.

In connexion with the Congress a reception was held at the Royal College of Surgeons, and Miss Mann gave a demonstration of pythons' eyes seen by the slit-lamp and of the ophthalmoscopic examination of various varieties of lizards and frogs at the gardens of the Zoological Society.

THE BANQUET.

The Jubilee Banquet was held on April 4th at the Hall of the Fishmongers' Company, with the President (Mr. LESLIE PATON) in the chair. Among the foreign guests present were:—Prof. Fritz Ask, Dr. Bailliart, Dr. Henri Coppez, Prof. Emile de Grósz, Dr. A. W. Mulock Houwer, Prof. J. van der Hoeve, Prof. Josef Meller, Dr. V. Morax, Dr. M. Marquez, Dr. E. Marx, Dr. René Onfray, Prof. Giuseppe Ovio, Dr. E. Pflüger, Prof. F. Terrien.

The President, in proposing the toast of the Society, said that of the 114 original members who held their first meeting in June, 1880, 11 survived. Two (Sir Thomas Barlow and Mr. J. B. Lawford) were present. Sir George Berry had been prevented from attending by urgent political business. Among the first vice-presidents had been George Critchett and that great clinical observer, Jonathan Hutchinson.

Mr. Paton advised any young man who thought he had discovered a new clinical fact to make perfectly sure that Jonathan Hutchinson had not already described it. He felt that we were on the verge of great advances in our knowledge of the structure of the body; that we were indeed standing on the boundary of a new and undiscovered country, some of the prominent features of which were beginning to show up through the mists of morning.

Sir THOMAS BARLOW, responding to the toast, described the origin of the society from a group of young men who had met in the house surgeon's room at Moorfields to discuss subjects which interested them. The first secretary, Edward Nettleship, had been clinical assistant to Jonathan Hutchinson. Nettleship had gathered up the experience of Moorfields and its great traditions; he had had the most comprehensive knowledge of the pathology of the eye. Another early member was Warren Tay, a modest man who had never achieved the reputation he deserved. Other original members were Stephen McKenzie, Brailey of Guy's Hospital, Morton, George Berry, and Marcus Gunn. Two great men not among the original members had had an abiding influence on the society—Jonathan Hutchinson and Hughlings Jackson. After the club had met for a year it had seemed time to enlarge its scope, and a circular letter had been sent round. Seniors who were not members had given generous support, among them William Bowman and William Gowers. The club and society had made a common meeting ground for surgeons, physicians, and pathologists, and that common ground had been one of the causes of its success. The history of the Ophthalmological Society was a lesson to the whole profession on the spirit in which specialties should be considered.

The health of the Bowman lecturer was proposed by Sir JOHN PARSONS. Sir Arthur Keith, he said, had two methods of attack when he found himself confronted with a new specimen of *Homo sapiens*. His synthetic method had made him the champion jigsaw puzzler of the world, and he had recently got into trouble with the theologians because he had been unable by his analytic method to find the soul. Descriptive anatomy was the valley of dry bones spoken of by Ezekiel, the prophet, but the prophet had had a vision, and Sir Arthur Keith must have imbibed that spirit, for no other anatomist was so good at making dead bones live.

Sir ARTHUR KEITH, in reply, said that the society had given him that afternoon the finest of all subjects on which to speak—a great man whose greatness had not been fully realised. The history of William Bowman had much to do with the success of the Ophthalmological Society. England was the recognised home of three great schools—the physiological, the neurological, and the ophthalmological—and between the last two there was something akin. Ophthalmology was not narrow; it dealt with the whole body. Men working at the retina were working at the brain, and it was possible to obtain more intimate insight into the great systems of the human body through the eye than through any other part.

The toast of "The Guests" was proposed by Mr. J. H. FISHER.

Prof. VAN DER HOEVE, in reply, conveyed greetings and thanks from the foreign guests, and on their behalf presented to the chairman an ivory presidential hammer. Bowman would, he felt, have approved of this gathering, for he had been one of the most international of scientists, visiting foreign centres and entertaining foreign scientists at his home. The society had kept to the high standard of scientific endeavour bequeathed to it by its first president.

Sir JOHN BLAND-SUTTON, who also replied, said that he had attended the second meeting of the society in December, 1880, at the invitation of Mr. Critchett, a man who had so impressed him as a student that he had nearly become an ophthalmic surgeon. Critchett had been ambidextrous, and would take out the lens of the right eye with the right hand and the lens of the left eye with the left hand at a single operation, and while he manipulated the cornea he had held his cataract knife in his mouth. In those days most ophthalmological work had been done by general surgeons, but the invention of the ophthalmoscope had changed all that. The ophthalmoscope was the prince of clinical instruments and ophthalmology the most justifiable of specialties.

Mr. TREACHER COLLINS proposed the health of the Chairman and Mr. LESLIE PATON briefly replied.

THE DISTRIBUTION OF LEAD INSIDE AND OUTSIDE THE BODY.

QUANTITATIVE INVESTIGATIONS INTO THE PRESENCE OF LEAD IN VARIOUS SUBSTANCES, AND ON ITS ABSORPTION AND EXCRETION.

IN the course of experimental work conducted by the Departmental Committee on Ethyl Petrol certain investigations were made, the results of which are of general interest independently of the purpose for which they were organised. They are concerned with the presence of lead in the urine, in dust of streets or garages, the amount of lead retained by the lungs, and so forth, and were performed under the direction of Mr. A. G. Francis, F.I.C.

Lead in urine.—Minute quantities of lead were found to be present in the urine of almost every subject examined (average 0·040 mg. per litre). Persons living in towns excrete more than persons living in rural districts, and persons exposed to a definite lead hazard excrete comparatively much larger quantities. These findings are in conformity with the observations of the United States investigators. The detection and measurement of minute quantities of lead in urine have been made possible by the greater refinement in analytical methods which has been achieved in recent years.

Lead in the settled dust of the streets.—This investigation was undertaken to ascertain to what extent the general population is liable to take in small daily amounts of lead. The results of the experiments show that the settled dust almost everywhere contains small quantities of lead (from nil to 3·3 per cent.). It is calculated that dwellers in London inhale, on the average, nearly one-tenth of a milligramme of lead in a day. It is therefore not surprising to find that lead is absorbed into the system as shown by its presence in the urine of normal persons.

Lead in the settled dust of garages.—In London small quantities of lead are found similar to those found in the settled dust of the streets, but far less than those in the dust of factories where lead is used.

Lead in lubricating oil.—Oil from the crank case of cars that have not used ethyl petrol contains no volatile lead, and only traces of non-volatile lead, the maximum proportion of non-volatile lead found being only 0·01 per cent., and this non-volatile lead is present in the "carbon," that is, it is insoluble in the oil itself.

A very slight quantity of lead was found in samples of lubricating oils from cars run on ethyl petrol, but it was calculated that the proportion of volatile lead remaining on the hands of a mechanic at any given time would not be likely to exceed 0·6 mg.

Proportion of lead retained in the lungs.—The conclusions reached were that (1) Dilution of exhaust gas containing lead compounds with air is rapid. (2) The likelihood of users of the streets inhaling a dangerous quantity of lead when "puffs" of lead compounds are blown out from the exhaust pipes of motor vehicles during the acceleration of their engines is remote. (3) The daily dose of lead likely to be retained in the lungs of vehicular drivers and

other users of the streets under traffic conditions more severe than obtain in the streets at the present time is far below the quantity stated by Legge to be the minimum quantity of lead which, inhaled as dust or fume, may in the course of years set up chronic plumbism.

The Absorption and Excretion of Lead by Normal Rabbits in Captivity.

Certain control experiments carried out by Prof. W. E. DIXON, F.R.S., on the absorption of lead yielded interesting results. Five rabbits were clipped for a space of about two inches square on either side of the back adjoining the spine. In five others the same area of hair was removed by a depilatory.

Two liquids were used for application to the skin. One of these was prepared from ordinary petrol. The petrol was redistilled, the last 5 per cent. left in the still being kept for use. The second liquid was used for purposes of comparison and consisted of petroleum ether which had been redistilled.

Five rabbits each received 15 drops of redistilled petrol on the shaved parts daily. The other five rabbits were treated in the same way except that petroleum ether was used. Each rabbit received in all 18·4 c.cm. applied to the skin.

The animals of this series received no lead except by contamination of the food or through dust, and neither of the volatile liquids which were applied daily contained lead. During the two months which the experiment occupied, samples of urine from each group were sent on three occasions for analysis in lead-free bottles and at the conclusion of the experiment, when the animals were killed, samples of the liver, brain, and kidney were also sent to the Committee's Laboratory.

The treatment had no effect on health or appetite, but one remarkable feature in the experiments was the fact that the urine from the petroleum ether rabbits was about three times as great as that from the petrol rabbits. This feature became less marked after the first few weeks, though later it again became pronounced. The exact figures of four typical rabbits were as follows:—

In the first 14 days two rabbits treated with redistilled petroleum ether passed on an average 210 c.cm. of urine a day. Two similar rabbits treated with the last 5 per cent. petrol passed on an average 55 c.cm. of urine per day; that is, in 14 days these last rabbits passed 1126 c.cm. of urine, whilst the petroleum ether rabbits passed 5450 c.cm. of urine. During the next seven days, whilst the petrol rabbits passed 2250 c.cm. of urine the petroleum ether rabbits passed 2620 c.cm. of urine. After a break of three weeks, during a period of ten days, the petrol rabbits only passed 1000 c.cm. of urine, whilst the petroleum ether rabbits passed 2240 c.cm. of urine.

The observations showed that normal animals in captivity absorb and excrete traces of lead. The lead is taken by the mouth with food or is absorbed as dust from the nasal mucous membrane. Most of that taken by the mouth we know is converted into the insoluble sulphide and passed out by the fæces unchanged. A very small amount of this is absorbed and a variable percentage, which is believed to be constant, is excreted by the urine, the rest being again excreted by the bowel. Some lead is retained, mainly in the bones, liver, and kidney. In acute poisoning as much as 95 per cent. of the retained lead has been found in the bones, but in chronic poisoning the bones contain very little.

In the normal control rabbits only about 3·7 mg. of lead was excreted by four rabbits in 54 days. No great difference occurred between the excretion in the two groups, though the larger amount of urine excreted in the petroleum ether rabbits carried with it a trace more lead. The livers, brain, and kidneys of these control animals also showed no appreciable amount of lead.

Experiments using ethyl petrol applications showed that the excretion of the lead under these conditions is mainly by the bowels and, further, that in the amounts used the rate of excretion kept pace, or nearly so, with the rate of absorption. The experiments proved that the daily application to the skin of rabbits of 0·27 c.cm. of 2 per cent. lead ethyl dissolved in distilled petrol is without ill-effect of any kind up to 130 days, in spite of the fact that the skin was specially prepared to facilitate absorption. To obtain a comparable experiment with ethyl petrol, on the assumption that ethyl petrol contains 1 in 1300 by volume of lead tetra-ethyl, 7 c.cm. would be required daily.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The San Francisco Cancer Sensation.

Dr. Walter B. Coffey and Dr. John D. Humber, of San Francisco, observed that the injection of an extract of the suprarenal cortex of the sheep causes softening and liquefaction of carcinomatous tissue. The observation came as the result of treatment of patients with hypertension who happened to have carcinoma as well. When these experimental observations were announced to the Pacific Coast Surgical Association, reporters of the Hearst press obtained word of them and whole pages were devoted to the great discovery and to the generous instincts of the press for the benefit of humanity as contrasted with the conservative reticence of the medical profession. Telegrams and letters began to pour in to the offices of every physician and association that might be suspected of esoteric knowledge of the "cure." The doctors were summoned to give evidence before a committee of the Senate in Washington what time cancer sufferers began to trek across the continent in the opposite direction. To calm the excited multitude it has been necessary to appoint a strong committee of investigation including Surgeon-General Cummings, Dr. Charles Mayo, Dr. Morris Fishbein, Dr. Francis Carter Wood, Dr. Joseph Colt Bloodgood, and others. The expenses of this committee are to be borne by the Chemical Foundation.

Osteopath as Health Officer.

A year ago the city council of Ellensburg in the State of Washington appointed an osteopath as city health officer. Acting under advice from the State Board of Health the incumbent physician refused to vacate office on the ground that the new appointee was not a "legally qualified physician." This conclusion of the State Board of Health was sustained by the first court but their judgment has now been reversed by the supreme court of Washington. The supreme court holds that the term physician has of late years been broadened to include the osteopath. The possibility of a health officer refusing to carry out the regulations of the Board of Health in regard to vaccination and the administration of antitoxin is one that the court does not seem to have had under consideration. An effort will be made to have the whole question reviewed. In the meantime the idea is slowly but steadily gaining ground that it is well to appoint to public health positions men who have diplomas in public health.

Secret Remedies on the Air.

The advertising of secret remedies in the more respectable journals is becoming less common. Proprietors of such wares have, however, discovered a profitable field of advertisement in the broadcasting stations with which this country is richly endowed. The first definite steps to correct this abuse have been taken recently in New York City, where the Public Health Commissioner, Dr. Shirley W. Wynne, has held three public hearings on the subject. Some 40 radio broadcasters decided that Dr. Wynne should select a committee of public

health officials and devise a plan by which broadcasters might receive explicit information quickly in programmes of a medical nature. Another committee of business associations is to report amendments to the code of ethics of the National Association of Broadcasters. Opposition takes the standpoint that any remedy or device which is not illegal has a right to advertisement; the larger broadcasting companies, however, agree that no remedy should be so advertised if it rests under any kind of suspicion. The Welfare Committee of the New Jersey State Medical Association has also taken some steps in opposition to radio quackery. The secretary of the Board of Medical Examiners has been kept informed of radio speeches that amounted to the practice of medicine and one man has already been convicted on a charge of practising medicine without a licence.

First-aid in Industry.

A method of organising first-aid and accident prevention work in industry has been worked out by Dr. D. L. Lynch, medical director of the New England Telephone and Telegraph Company. At first he attempted to spread a knowledge of first-aid by medical instructors, but he has found it more successful to train picked representatives from among the employees and to let them train their fellow workmen. These lay instructors are selected for qualities of leadership and once they have grasped the principles themselves are especially efficient in explaining them to other workers who in their turn are more willing to ask questions from a fellow employee. These trained men help to popularise modern methods of accident prevention and to bring for early treatment many cases that would suffer neglect but for a confidential intermediary. Many of the medical societies throughout the country are now reconsidering the official attitude of condemnation towards medical men employed by "contract" with industrial concerns. If one may judge from editorial expression in some of the State medical journals the profession is about ready to endorse this form of medical practice.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Road Accidents and Voluntary Hospitals.

THE burden put upon the voluntary hospitals by road accidents is steadily increasing here as in England. At the recent annual meeting of the Monkstown Hospital the chairman, Dr. W. M. Wright, stated that 90 cases of motor accidents had been treated in the hospital during the year, costing double the amount expended in respect of all other accidents. Many of those injured are well-to-do people, who make little or no contribution to the hospital funds. And, again, for a high proportion of the road accidents someone is made amenable at law, and therefore liable for damages. In the great majority of such cases the hospital gets nothing. The board of Monkstown Hospital passed a resolution asking that a law should be passed to render insurance against third party risks compulsory on all motor-drivers, and making the cost to voluntary hospitals in case of motor accidents a first charge on the insurance money.

The Royal Victoria Hospital, Belfast.

The senior surgeon to this hospital, Mr. A. B. Mitchell, has retired from active duties in the wards to the great regret of his colleagues. He has been elected consulting surgeon, and his administrative abilities will be retained in its service in his capacity of vice-chairman of the board of management. He is succeeded in the wards by Mr. P. T. Crymble, surgeon to out-patients. Mr. G. R. B. Purce has been elected assistant surgeon.

The late Dr. Charles Dundee.

Dr. Charles Dundee, who died unexpectedly at Ballycarry on April 3rd after a brief illness, belonged to a medical family well known in County Antrim. He was the son of Dr. C. Dundee, of Ballycarry, the brother of Dr. W. B. H. Dundee, of Ballynure. He was educated at the Royal Academical Institution, Belfast, and Edinburgh University, where he qualified in 1913, taking the D.P.H. a year later. During the war he served with the Ulster division, and was gravely wounded, losing his left arm. He received the Military Cross for great gallantry under fire. After demobilisation Dr. Dundee was appointed assistant tuberculosis officer for Co. Antrim. He had a charming manner, and was as popular among practitioners as he was in the public health service. Moreover, he took an active interest in the farming community amid which he lived.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

A Fatal Accident with Diathermy Apparatus.

A FEW weeks ago public attention was aroused by an accident which caused the death of a well-known physician specialising in electrotherapy. The physician was seen by a servant when he was standing in front of the apparatus, the lid of which was open, with both his hands inside the machine making some adjustment. Suddenly she saw a bunch of sparks darting from the apparatus, heard a scream, and saw her master fall to the floor. She ran to him and screamed for help, but some time elapsed before anyone came to the scene of the accident. Even when medical help was procured, it was first thought that the physician, who had suffered from heart trouble, had had an attack of angina pectoris; thus valuable time was lost before artificial respiration was instituted. When the real cause of the accident became evident it was too late. Subsequent investigation showed that the physician had been the victim of his own insufficient precautions. He had a pair of indiarubber shoes on his feet and indiarubber gloves on his hands, but these latter were not in perfect condition. He had evidently switched on the current whilst working on the apparatus, in the attempt to find the origin of a fault in the machine, believing that he had insulated himself. This accident has caused alarm among patients who are unwilling to undergo medical diathermic treatment, though it has been publicly stated that diathermy is absolutely free from danger to the patient. The unfortunate physician met his death only because he unscrewed the lid of the machine and meddled with the fittings without turning off the current of 220 volts which passed through his body. This is the first instance on record of death caused through the medical diathermy set.

Treatment of Detachment of the Retina by Ignipuncture (Gonin's Method).

At a recent meeting of the Vienna Medical Society Prof. Lindner demonstrated nine patients on whom he had successfully performed the so-called Gonin's method of operation for detachment of retina. The method consists in cauterising the torn edge by means of an electric cautery. Prof. Gonin uses the cautery for four seconds, whilst Prof. Lindner leaves it in *situ* for from 8–15 seconds. Dr. Guist, Prof. Lindner's first assistant, has constructed an apparatus which works like a perimeter, with which he is able to locate the exact point to be cauterised. Hitherto the difficulty of locating this spot has been a great disadvantage of the method, so that Guist's appliance is a distinct and important advance. Prof. Lindner claimed that in detachment of less than four weeks'

standing over 50 per cent. of permanent cures could be obtained by the galvanocautery. Older cases of detachment, however, rarely gave very satisfactory results. This "new" method, although now practised by its author for several years, has not many adherents outside of Switzerland, where Gonin works, and Lindner's clinic is probably the only place in Austria where this operation is being systematically tried out.

Legal Protection of the Title "Dentist."

The Board of Education has recently issued two orders which are the result of protracted negotiations between the dental section of the Wirtschaftliche Organisation (Union of Practitioners) of Austria and the Government, concerning the right of a medical man to style himself "dentist." This is the first instance in this country of legal protection of the title of a specialist in any one branch of medicine, and it is expected that it will soon be followed by a general declaration of what training a specialist must have in order to claim this title. According to the new regulations a dentist must first of all pass all the examinations necessary for qualification as a doctor in this country; then he must work for at least two years at a dental clinic, and, moreover, pass an examination showing his proficiency in anatomy, pathology, and surgery of the teeth, and mechanical dentistry. Furthermore, he must practise in dental work exclusively, and may not combine it with any other branch of medicine. Of course, any medical man is entitled to do dental work as a part of his other medical work, but he is not to call himself dentist, but remains a general practitioner.

Detection of Diseased Arteries by Uroselectan.

At the last meeting of the Gesellschaft der Aerzte Dr. Sgalitzer, from Prof. Eiselsberg's clinic, together with Dr. Kollert, showed a new method for the examination of arteries by means of X rays. The artery is laid bare under local anæsthesia, and 10–15 c.cm. of uroselectan—an organic compound of iodine, in which the iodine is firmly attached to the organic molecule, is injected into the artery with a fine needle. There is no danger of iodism, as has been amply demonstrated by using this drug in pyelography, and no free iodine appears in the urine. As the injection into the artery is sometimes painful, it is desirable to give a few whiffs of ethyl chloride to induce light general anæsthesia. If the arteries are believed to be diseased, the strictest aseptic conditions must be observed. The injection is in the first place done for diagnostic purposes; hitherto ten patients have been so treated. In some cases (one a case beginning gangrene of the big toe) a remarkable improvement has been the unexpected result. The authors, who have been assisted by a surgeon, Dr. Demel, have hitherto tried this method only on the arteries of the extremities, and have demonstrated the presence of emboli, thrombi, endarteritic, and arterio-sclerotic changes or spastic conditions. By combining the uroselectan injection with vaso-dilating substances, it is possible to differentiate spastic from organic stenosis of the vessels. If deposits of lime are visible in the arterial wall, before injection, the evidence is in favour of organic disease. If spastic conditions are found, treatment with yohimbin (1–5 mg. per day) is said to give good results, especially in ischæmic conditions like nicotine-intoxication or syphilitic endarteritis. Investigations of the capillaries under the finger-nail margin after uroselectan injections gave very interesting results. They show that these injections distinctly influence the circulation in the capillary system in the direction of increased pressure and flow of the blood stream. The indications for the new method are as yet not established. But in aneurysm of the peripheral arteries and in various pathological conditions of the venous system it should give useful results. So far it has served to localise exactly the site of an embolus, and the site of election for amputation in cases of peripheral occlusion of an artery.

CONFERENCE ON BIRTH CONTROL.

THE GIVING OF INFORMATION BY PUBLIC HEALTH AUTHORITIES.

A CONFERENCE organised by the National Union of Societies for Equal Citizenship, the Society for the Provision of Birth Control Clinics, the Women's National Liberal Federation, and the Workers' Birth Control Group, to discuss the giving of information on birth control by public health authorities, was held at the Central Hall, Westminster, on April 4th.

Birth Control and the Population Problem.

Dr. KILLICK MILLARD (M.O.H., Leicester), who presided at the morning session, said he was impressed by the profound change in the public attitude to this question in the last few years. The principal object of this conference was to emphasise the demand to the Ministry of Health to remove the embargo against the giving of information on birth control at municipal antenatal clinics. If birth control was to be justified as a national policy it must be based on something broader than individual hardship—that is, on the assurance that there were sound national and international grounds for believing that unlimited increase of population was not desirable.

Mr. HAROLD WRIGHT gave an able exposition of the Malthusian doctrine, and explained that the demand for increasing population might be met either by a falling death-rate or a rising birth-rate, but there was all the difference in the world between the two in terms of human well-being and happiness. Mr. Wright regarded birth control as an unmixed good, both from the point of view of the individual and of the race as a whole.

Birth Control and Maternal Health.

The CHAIRMAN referred to a statement made by Dr. Vernon Davies in the House of Commons recently, that competent gynæcological and obstetric surgeons were opposed to birth control, and quoted figures of answers received by him to a questionaire on this subject to prove that the opposite was the case.

Mr. HAROLD CHAPPLE, F.R.C.S., based his arguments on three fundamental questions: (1) Were there any medical grounds on which married people needed information about birth control? (2) Had they a right to it? (3) Were the public health authorities the people who should supply it? He believed the answer to all three questions to be in the affirmative. The out-patient department of any hospital would supply ample evidence on the first point. A woman with several children, suffering from an uncompensated heart and again becoming pregnant, a tuberculous patient, or a woman with kidney disease, furnished three gross and obvious examples of cases which existed in thousands. People who objected to birth control asked why it should not be possible to exert such self-control that these catastrophes never occurred. Mr. Chapple thought that people who put that forward as a serious suggestion must have either a very limited or a very fortunate experience. For those obliged to share a bed it would impose a physical strain too great to be borne. In some persons the sex urge was comparatively slight, in others an almost overwhelming force. Much clinical experience led him to the conclusion that there was no such time as a "safe" period. The underlying principle of birth control was in line with the medical view of prophylaxis. Modern devices might occasionally produce a little local soreness, but Mr. Chapple had never seen a case in which real harm had been done. These methods were available to the well-to-do, why should they be withheld from people whose one source of information was that of clinics? This kind of teaching could not be given in the out-patient departments of hospitals. Knowledge need not be thrust on people who did not want it, those who did want it had a right to it. He urged local authorities to help

in bringing about what he believed would be a great blessing.

Dr. HELENA WRIGHT spoke from her personal experience at a birth control clinic on the effects of sound birth control knowledge and practice on maternal health. There were good and bad methods of birth control, and a good method must be reliable, harmless to the health of mother, father, and children, easy to learn and apply, and cheap. The question was not one touching the poor alone; there came a time in every family when the mother decided that she had enough children. If she was denied a knowledge of birth control four alternatives were open to her: (1) she could continue to live in her present state of anxiety, resulting in strained relationships between her and her husband and children; (2) the father and mother could decide to live henceforward merely as friends, but this would also submit the partners to an unreasonable and unnatural strain; (3) the couple could devise home-made methods of birth control, as was frequently done. The commonest procedure was what women described as "being careful," which was quite unreliable and a complete denial of the physical side of married life; (4) the fourth alternative was the sinister business of abortion. If an ideal method of birth control could be discovered there ought never to be another deliberately induced abortion. Another result, though an indirect one, would be that in properly conducted hospitals where knowledge could be obtained women might come for regular examination, with the result that all diseases of the pelvis could be prevented or attacked at an early stage.

Miss STELLA BROWN put in a plea, in which she was supported by the Hon. Mrs. BERTRAND RUSSELL, that abortion, properly conducted in hospital in the early stages of pregnancy, should be legalised in this country as it had been in Norway.

Dr. HALLIDAY SUTHERLAND drew attention to the fact that nobody had suggested reducing the size of families by the improvement of living conditions; the whole thing depended on environment. The effect of birth control on maternal mortality should not be overlooked: Bermondsey, with a high birth-rate, had a maternal mortality-rate of 2 per 1000, whereas Westminster, with a low birth-rate, had a maternal mortality-rate of 12 per 1000. Danger to the mother was greatest in the first confinement, the risk becoming progressively less until after the fourth, and the lowest death-rate was among the youngest group of mothers. Undue delay of the first confinement and too prolonged spacing of the family increased the risk of death in childbirth.

Dr. F. A. BELAM (M.O.H., Guildford) said there was much confusion of thought and ignorance about the difference between birth control and abortion, and it was of great importance that information should be properly given and not picked up haphazard.

Mrs. EVA HUBBACK, who took the chair at the afternoon session of the conference, said that discussion of the attitude of the public health authorities was peculiarly opportune at the present time, since under the new Local Government Act the local authorities would have more power to undertake any work they chose. Under the Maternity and Child Welfare Act it was the duty of the public health authorities to give advice to pregnant mothers, and advice on birth control should be an extension of this power. The session would be confined to a discussion of methods of conveying the necessary information to married women.

Dr. MAITLAND RADFORD (Shoreditch) said that public health measures were continually defeated by ignorance in the homes. It was impossible for a poor mother of 10 or 15 to preserve a suitable environment for growing children, or even to provide accommodation for them. Contraceptions were much more freely used in the middle than in the labouring classes. He recommended that advice on birth control should be given (1) to those in whom the physical condition was such as to make pregnancy a danger to life; (2) to tuberculous and syphilitic women, at special centres to which all women requiring this advice should be referred. Men attending tuberculosis and venereal centres should also receive instruction in contraception; (3) to women with limited incomes, and growing families, to prevent overcrowding. Birth control centres should be under the charge of medical women supported by trained nursing staffs. The information should not be combined with advice at infant welfare or antenatal clinics, since these subjects were wide enough in themselves. The public health authorities should coöperate with existing voluntary centres, and later establish centres of their own. At Shoreditch a women's hospital was to be opened at which this advice would be given in addition to medical and surgical treatment of disease.

Mrs. POWELL (Reigate) described the origin of a birth control clinic in connexion with the maternity and child welfare work in her area. The town council had raised no objections to the scheme.

Mrs. D. THURTLE thought the chairman unduly optimistic about the powers of the local authorities under the new Act, but said that it was important to involve them in the work as much as possible, so that the movement would have become a powerful one should the Ministry of Health intervene later. As to methods, country districts might be supplied by travelling clinics; welfare centres and sunlight clinics might permit the use of their buildings on vacant days. Mothers would be more ready to attend a familiar place where the personnel was known to them.

Mrs. H. J. LASKI said that in 1925 the Ministry of Health had issued a circular to maternity and child welfare centres saying that women who appeared to require advice on contraception on medical grounds should be referred to a private practitioner, to a hospital, or to a birth control clinic. In practice it was found that these patients were not cordially received at hospitals, that the clinics were too few, and that the medical practitioners recommended by the Ministry could ill spare the time to give detailed advice to women who, moreover, could seldom afford a fee. The expense of starting centres in the buildings at welfare clinics should not be great. Birth control should, of course, be taught on days other than those devoted to welfare work. Proposals for new centres should certainly be put before local authorities, but the work was urgent, and should be undertaken at once, using existing means.

Mrs. SYDNEY FRANKENBURG thought that centres should be run in association with a welfare clinic or hospital. She gave practical details of a centre which was running satisfactorily. A small charge was made to the women.

Among other speakers Dr. NORMAN HAIRE said that though no fool-proof contraceptive had so far been available, constant experiment was leading to improvements. All methods required care and attention to be successful. The question of expense was subsequently discussed, and the possible increase in rates as a result of establishing centres was mentioned.

In replying, Dr. RADFORD said that spacing of children should be part of public health work for economic as well as hygienic reasons. A spread of opinion in favour of birth control would lead to its inclusion in the public health scheme.

Resolution.

In conclusion Mrs. HUBBACK moved the following resolution:—

"That this Conference calls upon the Minister of Health and Public Health Authorities to recognise the desirability of making available medical information on methods of birth control to married people who need it on medical grounds or who ask for it."

Dr. RADFORD proposed an amendment to the effect that the resolution should stop short at the words "who need it." This was carried, and the amended resolution passed.

Correspondence.

"Audi alteram partem."

ATHLETICS IN SCHOOLS.

To the Editor of THE LANCET.

SIR,—With deference to Dr. Cove-Smith it seems difficult to agree with some of his views on rowing. When rowing is properly taught the muscles of the trunk and limbs are brought into play with the work apportioned so as to avoid certain of these muscles becoming "overworked at the expense of others." The heaviest strain is put on the back and thighs, regions which are best provided to meet it. The hands and arms deal with the finish of the stroke, the feather and the clearing of the hands quickly over the knees before sliding forward for the next stroke. The last of these three phases is carried out by the action of the triceps, and, although it comes into action and development more than the biceps or other muscles of the upper arm, it scarcely can be said to be "overworked," or even "overworked at the expense of the other muscles."

Dr. Cove-Smith states "the return flow of blood from the lower half of the body is not adequately provided for." I must confess I am too dense to discover his meaning here. With feet on the stretcher they are merely a few inches below the level of the hips. In the swing back they are only a very little more than this below the level of the heart. A further assistance to emptying the veins is brought about in the constant muscular actions from abdomen to feet in the bendings at hips, knees, and ankles. Has anyone ever heard of varicose veins, or unduly dilated veins of the legs or abdomen occurring as a result of rowing? Varicose veins of the legs are occasionally seen, but the condition is neither due to rowing, nor affected by it.

One can agree with Dr. Cove-Smith when he says that provided the individual is of "sound constitution he will derive benefit from rowing, but otherwise he may do himself more harm than good." There is no great need, too, for uneasiness on this point. If the fact of being unsound has not been discovered before taking up rowing, it will very quickly be seen, once he attempts to learn. His coach will notice it and the beginner will be conscious of it himself before he meets with the amount of strain that would be injurious. Rowing is only for those that are sound. It does not seem necessary, though, to weigh the question of physique with as much importance as that of soundness. Rowing is a fine developer of physique and, provided a youth is organically sound, its fascination need not be confined to those who are the pick in this respect.

What is the "distinct medical problem at the present" in the middle-aged man, formerly a rowing man, that is referred to? Can it be a tendency to obesity? This does not seem to occur more frequently from rowing than from some of the other forms of athletics. It should be remembered, too, that rowing has a good percentage of what can be looked on as the hefty type. It was only on Saturday last in the head-of-river race over the Mortlake to Putney stretch of 4¼ miles an eight in the first division was stroked by an oarsman of 60! And covered the distance in 20 minutes, in or about. An outstanding oarsman, it is granted. In the same race there was a crew in which none of the members were under 40! What is the "distinct medical problem" to be put down as? And with regard to what are referred to as "the faulty methods of training of the last century," these methods evidently did not injure the stroke of 60 years of age. The crew of "40 and over" would escape them as very likely each member would have been too young to be in training then.

Dr. Cove-Smith's views on Rugby football for boys are naturally valuable, and personally I give due weight to his opinion that the game should be under taboo before public school age.

I am, Sir, yours faithfully,

J. ARMSTRONG HARTLEY.

London, S.W., April 5th, 1930.

INTRAVENOUS INJECTION OF ETHYL ALCOHOL.

To the Editor of THE LANCET.

SIR,—In your issue of June 15th, 1929 (p. 1247), Dr. J. D. Constantin (Greenwich) described a method of general anæsthesia by the intravenous injection of ethyl alcohol advocated by Dr. M. G. Marin, of Mexico City. Dr. Constantin writes: "The use of ethyl alcohol intravenously had not, as far as I know, been reported until Dr. Marin's experiments became known. (Thesis presented to the National University of Mexico, 1929.)" I should like to call his attention to the fact that in 1927–28 I published in the *Zeitschrift für Krebsforschung* and in the Polish medical journal *Czasopismo Lekarskie* a method of cancer treatment consisting in intravenous infusion of 33·3 per cent. ethyl alcohol (in Ringer's or physiological salt solution). To this method I was brought by theoretical reasoning, and I was able by many animal experiments to prove that intravenous infusion of great quantities of ethyl alcohol, even in absolute form, can be given without danger

I am, Sir, yours faithfully,

Warsaw, March 28th, 1930. Dr. D. THURSZ.

IRRADIATED ERGOSTEROLS.

To the Editor of THE LANCET.

SIR,—Keen commercial competition combined with the modern craze for an all-vitamin factor in dietetics will soon flood the market with a series of proprietary food products of questionable quality, specially milk products guaranteed to contain a fair proportion of vitamin D. Experimental evidence is far from convincing, and remarkably divergent views are expressed regarding the general use as a therapeutic or prophylactic measure of a concentrated vitamin D factor in irradiated milk. The more one reads of vitamin D, the more is one convinced of the limited knowledge we still have of this accessory food substance. It will be many years before vitamin D problems can be recognised on established basis. It is premature, therefore, to employ a principle of doubtful utility to improve a standard natural product such as milk. To alter the properties of fresh milk by artificial light radiations or by the addition of a foreign product and to recommend this for general use is from all points of view against natural laws—the same laws which control vitamin active principles. For, have we not been told ever since Funk discovered "vitamine" that all similar unidentified factors or accessory food substances are most likely to be present in natural food? Moreover, if we are at all to accept Dr. K. Coward's recent alarming report that fresh milk, the only natural food for infants taken during all seasons, contains hardly any vitamin D, then the logic of irradiating milk to concentrate the same active principle for use as an antirachitic measure in infants is unsound.

Apart from these considerations, reports from reliable observers on the dangers of indiscriminate use of highly concentrated irradiated milk products cannot be over-estimated. Idiosyncrasy undoubtedly plays an important part and it is a well-known fact that a certain type of infant cannot tolerate cod-liver oil in any form. Specially during the summer months toxic and unpleasant symptoms of gastro-intestinal derangement are known to follow a minimum quantity even of ostelin. Every mother in the tropics knows that dermatitis, eczema, and boils result from the use of cod-liver oil. In two cases that came under my observation, the latent period of tolerance, so

common with a new product in cases of unsuccessful feeding of infants, was not observed with irradiated milk. Unlike the older products, irradiated food disagreed from the start and unpleasant symptoms developed immediately every time it was tried.

The manufacturers should arrange for a clean, fresh, and wholesome product, in quality as near as possible to the natural food. The addition of a therapeutic or prophylactic principle for special cases should be left in the hands of the medical attendant. To sell a concentrated prophylactic or therapeutic product for general use is against all principles of dietetics. Why has the vitamin D factor alone been advocated as a prophylactic measure? The calcium-phosphorus ratio as a determining factor in hypovitaminosis and rickets has been well recognised. If the public craze went as far as the calcium-phosphorus ratio, I daresay commercial houses would soon arrange to adjust the percentage of calcium and phosphorus to meet all requirements. And may I also ask why the sound principle of Fowler to inoculate milk with live tubercle bacilli as a prophylactic against tubercle has never been thought of?

I am, Sir, yours faithfully,

F. N. MOOS,

March 14th, 1930. Superintendent, G.T. Hospital, Bombay.

RELIEF OF BLINDNESS IN INDIA.

To the Editor of THE LANCET.

SIR,—I feel sure that it is contrary to your intention that the well-meaning leading article in THE LANCET of Dec. 21st should be liable to do an injustice, or create an incorrect impression of the actual facts concerning the relief of blindness in India or the teaching of ophthalmology. As it will appear to ophthalmologists resident in India that it may do so, may I be permitted to point out that some important facts bearing on your article may be found in an editorial in the *Indian Medical Gazette* for September, 1929, on Preventable Blindness in India, and in the report of Sir Norman Walker to the General Medical Council. Many of your readers may not have the opportunity of seeing the *Gazette*. You may therefore consider it desirable to represent some of the views therein expressed.

I am, Sir, yours faithfully,

ROBERT E. WRIGHT.

Government Ophthalmic Hospital, Madras.

ENLARGEMENT OF ADDENBROOKE'S HOSPITAL.—The Hon. Alexandrina Peckover has opened a second women's surgical ward of 27 beds. It has been named the Musgrave ward, in recognition of the services to the hospital of Mr. T. Musgrave Francis as chairman for several years of the general committee.

MEMORIAL TO HENRY HILL HICKMAN.—A tablet in memory of Henry Hill Hickman, for the erection of which part of the fund collected has been allocated (see THE LANCET, April 5th, p. 775), was unveiled at the Church of St. Mary the Virgin, Bromfield, Shropshire, on April 5th by Sir StClair Thomson. The tablet was dedicated by the Bishop of Hereford.

The ceremony took place in the presence of descendants of Dr. Hickman and the President and five Past-Presidents of the Section of Anæsthetics of the Royal Society of Medicine. Among those present were:—

Lord Plymouth, Lieut.-Colonel G. H. and Mrs. Windsor-Clive, Mr. W. Thomson Madin and Mr. C. H. Howkins (representing Birmingham University Dental School), Dr. J. R. Bulman, Mr. V. Warren Low (treasurer of the Hickman Memorial Fund), Dr. Cecil Hughes (hon. secretary), Mr. Raymond Apperley, Sir Francis Shipway, Dr. Z. Mennell, Mr. M. Ashley Daly, Mr. H. E. G. Boyle, and Dr. Ryan.

The inscription on the tablet is as follows:—

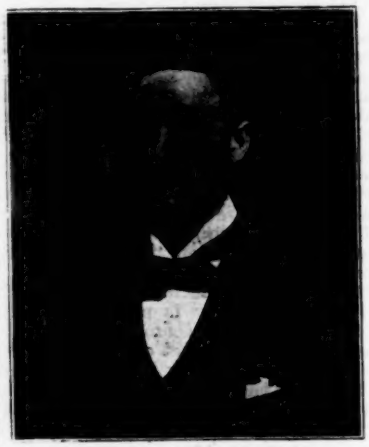
A.M.D.G.: Henry Hill Hickman, member of Royal College of Surgeons; born at Lady Halton in this parish January 27th, baptised in this church January 30th, 1800; died at Tenbury April 2nd, buried in this churchyard April 5th, 1830. This tablet is placed here at the initiative of the Section of Anæsthetics of the Royal Society of Medicine as a centenary tribute to the memory of the earliest known pioneer of anæsthesia by inhalation. Honour a physician with the honour due unto him. A.D. 1930.

Obituary.

JOHN YULE MACKAY, M.D. GLASG., LL.D.,

PRINCIPAL OF UNIVERSITY COLLEGE, DUNDEE.

Dr. Mackay, whose death at Broughty Ferry on March 30th was announced in our last issue, was in his 71st year. He resigned the chair of anatomy at the University of St. Andrews three years ago, but continued to hold the Principalship of University College until his death. John Yule Mackay was born at Inverkeithing, Fifeshire, where his father, the Rev. James Mackay, was minister, and studied at Glasgow University, where he graduated in medicine in 1882, taking his M.D. three years after. For 12 years he was demonstrator in anatomy at the University, and lecturer in embryology.



DR. MACKAY.

In 1894 he was elected to the chair of anatomy at University College, Dundee, in succession to Prof. A. M. Paterson, who was transferred to Liverpool; and later when Paterson was appointed to the Vice-Chancellorship of McGill, Montreal, Mackay succeeded him as Principal of the Dundee College. It was at a time when feeling was running high on the question of union between the College and St. Andrews University, and Mackay played a large part in the delicate negotiations which made the college an integral part of the university in 1897. Quiet and unassuming in manner, Mackay was an effective worker. During his period of office University College rose from a school of nine faculties to one of 14 with two lectureships, and Dundee came to hold its own with its rivals. The staff and students of the college found in their Principal a personality of subtle charm and transparent sincerity, and came to regard him with warm affection.

The services rendered by Principal Mackay to medical education are not yet as widely recognised as they should be. It was in 1902 that he was elected to the General Medical Council to represent the University of St. Andrews, and within four years he became chairman of the Education Committee holding that position until 1927. Those 20 years were critical for the education of the medical student, especially in preliminary scientific subjects, and almost every year, as the appendices to the Council's minutes testify, reports were drawn up and presented for which Mackay took a large share of responsibility. In 1907 appeared the interim report on the length of the curriculum and ages of students; in 1911 the report on preliminary general examinations; and in 1922 the final report on the revision of the curriculum was approved by the Council. Dr. Mackay being formally thanked from the chair for his services. As a result of these reports the curriculum was rearranged to ensure a period of three years at least between completion of anatomy and physiology and the qualifying examination, opportunities being offered in this period for the study of biology and physiology in their applications to medicine, surgery, and midwifery, and insistence being laid on the principle that throughout the whole period of study the student's

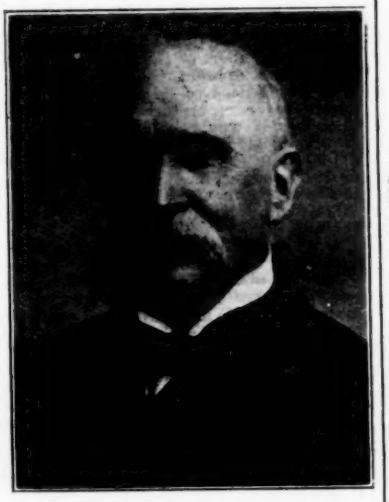
attention should be directed to the importance of the preventive aspects of medicine. All these things have now passed into the framework of the curriculum, and it was Mackay's devoted work as chairman of the Education Committee which made the transition possible.

In his own subject of anatomy he produced a number of books and papers. Along with the late Prof. Cleland, of Glasgow University, he brought out a text-book of human anatomy, general and descriptive, and his "Directory of Dissection" run through four editions. His earlier studies dealt chiefly with the comparative anatomy of the circulation.

Principal Mackay was unmarried.

SIR JOHN FAGAN, F.R.C.S.I.

Sir John Fagan died on St. Patrick's Day at his home in Portarlington, aged 86. He came of old Westmeath stock and was educated at the famous Castleknock School and at the Catholic University in Dublin, qualifying in 1865. He studied in London, Paris, and Vienna, and then returned to Ireland, settling in Belfast, where he was appointed surgeon to the Royal Hospital in 1872, becoming F.R.C.S.I. in 1874. He was especially interested in the surgical diseases of childhood, and, with the late Dr. Brice Smyth, founded the Belfast Hospital for Sick Children in 1873. Nearly sixty years later he was to see the foundation-stone of a greater Children's Hospital laid in ideal surroundings, and to know that it would take its place with the Royal Victoria and New Maternity Hospitals in a group of teaching hospitals. His services to the Children's Hospital are to be commemorated by a memorial in the new institution. Sir John Fagan was the last link of the Belfast Medical School with pre-Listerian surgery. He was the first surgeon in that school to adopt and practise Listerian principles. If he had practised in these latter times his bent would have been orthopædic surgery. Considering the incomplete pathological knowledge then available he showed a wonderful grasp of the principles of reparative surgery, and was among the earliest surgeons of his generation to substitute extensive resections of the so-called "scrofulous" joints for amputations. In this way he saved many valuable limbs.



SIR JOHN FAGAN.

Photo by Lafayette, Dublin.

Fagan was the first man in Belfast to confine his practice to surgery, breaking the tradition of combined general practice and surgical consultant work. With a younger colleague he opened a private hospital, and had much difficulty in convincing not only the public, but also the practitioners, that surgical operations could be performed with much greater safety in such surroundings than in private houses. He was twice elected to the Presidency of the Ulster Medical Society, was one of the few honorary Fellows of this society, an honour which he shared with Lister. The tone and reputation of surgery throughout the North of Ireland was raised by Fagan's work, to which he was apparently devoted, and it came then as a shock to his friends and to those accustomed to depend on his skill, when in 1897 he gave up his position as senior surgeon to the Royal Hospital and his extensive surgical practice in Ulster for the post of Inspector of Reformatory and Industrial Schools. This necessitated his return to Dublin. In his new work he was again a pioneer in attacking the methods of education and training then in vogue in reformatory schools. He risked grave unpopularity by instituting the methods which are still in force, and have received general praise. His success in these innovations was recognised by his appointment as medical member of the General Prison Board. Later he became a Deputy Lieutenant of the county, and was knighted in 1910.

Sir John Fagan had a fine presence and gracious manners. His relations with his colleagues and his patients were cordial. His clinical teaching was painstaking, clear, and decisive; and his old students—now a rapidly decreasing band—speak of him still with deep regard and affection.

Public Health Services.

MENTAL HOSPITAL REPORTS.

THE work of the *Royal Edinburgh Hospital* at *Morningside* now includes the care of certified patients at Craig House and the West House, and the prophylactic and early treatment of uncertified persons at the Jordanburn Nerve Hospital and a series of Associated Nursing Homes in and around Edinburgh. In the first two houses there were 847 patients on the register at the end of last year, and of these no less than 170 were on a voluntary basis. In the six nursing homes there were 62 patients, and 459 persons have passed through them in the last three years. Many of the patients come from England and Ireland to escape certification, and so great is the demand on the accommodation that four more homes are being equipped. Jordanburn has not yet been opened a year; it has 50 beds for patients of limited means, and more than half of them have been occupied most of the time it has been opened. An out-patient clinic is held every afternoon. Dr. G. M. Robertson discusses the abolition of certification in recoverable cases, and gives some interesting examples of stereotypy. The laboratory has been carrying out research on encephalitis lethargica and has found that the brain is much more extensively affected than is usually supposed, especially in the cortical area.

The *Glengall Hospital* at *Ayr* had 607 patients in residence at the end of last year, and of the 172 admissions seven were voluntary. More cases than ever are being sent in a precarious physical condition, and there is thus a high demand on the skill and devotion of the nursing staff. The recovery-rate was 36 per cent. and the death-rate 14·5 per cent. The illness had lasted for more than a year before admission in 88 per cent. of the fatal cases, and the medical superintendent points out the importance in mental cases of the adage "Save me from my relatives." The general health during the year was good, and there was no epidemic disease. A fuse in an electric wire caused a serious outbreak of fire, but all the patients were safely removed in five minutes—in ten minutes part of the roof fell in—and provided with other beds within a couple of hours. By 10 o'clock the next night the distribution of patients throughout the whole institution had been completely rearranged. A large proportion of the patients are occupied in work in the hospital. Six nurses and two attendants obtained their R.M.P.A. certificate during the year, and 51 per cent. of the nurses and 48 per cent. of the attendants are now fully qualified.

The *Aberdeen Royal Mental Hospital* housed 803 patients on the last day of last year. Voluntary

patients numbered 29·72 per cent. of the total admissions. The recovery-rate was 27·1 per cent., and the death-rate 8·6 per cent. Malarial therapy is still being used for general paralysis and has given a 40 per cent. remission-rate. A severe outbreak of influenza took place early in the year, and 21 cases of dysentery occurred; search for a carrier was unsuccessful. The dentist visits weekly and the physical benefit derived by the patients from dental treatment has been obvious. A large number of patients were examined radiologically and treated by light, and the occupational therapy department had a successful sale and exhibition in the autumn. A pavilion for tuberculous women has been opened and will take 20 patients. Twelve patients have had parole outside the grounds, and 68 within them.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 29TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 449 (last week 361); scarlet fever, 2540; diphtheria, 1598; enteric fever, 46; pneumonia, 1367; puerperal fever, 71; puerperal pyrexia, 99; cerebro-spinal fever, 15; acute poliomyelitis, 1; acute polioencephalitis, 2; encephalitis lethargica, 17; typhus fever, 1; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 95. No case of cholera or plague was notified during the week.

The case of typhus was notified in the Metropolitan Borough of Shoreditch. The patient is a girl of 15 who with her mother has been admitted to the Western Fever Hospital and is still under observation. Up to the present the Weil-Felix test is negative in both mother and daughter.

The number of cases in the infectious hospitals of the Metropolitan Asylums Board on April 1st–2nd was as follows:—Small-pox, 570 under treatment, 28 under observation (last week 545 and 23 respectively), scarlet fever, 2125; diphtheria, 2750; enteric fever, 20; measles, 1052; whooping-cough, 74; puerperal fever, 26 (plus 16 babies), encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 26. At St. Margaret's Hospital there were 12 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was one death from small-pox, 2 (0) from enteric fever, 159 (80) from measles, 15 (5) from scarlet fever, 46 (3) from whooping-cough, 57 (17) from diphtheria, 58 (16) from diarrhœa and enteritis under two years, and 76 (11) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Tottenham Urban District (Middlesex); we understand that cerebral hæmorrhage was also mentioned as a cause of death. The deaths from enteric fever outside London were reported from Bath and Doncaster. Fatal cases of measles were more widely distributed with larger numbers at Manchester, 8; Portsmouth, 7; Middlesbrough, 6; and Chester, 4. (Glasgow also reported 10 deaths.) Whooping-cough claimed 4 victims at Birmingham; 3 each at West Ham; Bootle and Middlesbrough. Diarrhœa accounted for 5 deaths each at Stoke-on-Trent and Manchester. Leeds reported 6 deaths from influenza; Manchester, 4; and South Shields, 3.

The number of stillbirths notified during the week was 305 (corresponding to a rate of 41 per 1000 births), including 59 in London.

ROYAL MEDICAL BENEVOLENT FUND.—The following is an additional case relieved at the last meeting:—

Widow, aged 56, of L.R.C.P. & S. Since the death of her husband in 1919 the widow by keeping a boarding house has maintained herself and educated three children. The children have now all obtained posts and commenced to earn. During the last two years, although the widow has been extremely hardworking and is a very thrifty woman, the boarding house has not brought in a profit. This is due to competition and general depression in the district. Rates fell into arrears and debts were outstanding. Fund voted £40 to pay the rates.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W.1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

THE Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Thursday, April 3rd. Mr. CECIL WILSON was in the chair.

Transference of Powers and Duties.

On the Second Schedule, which transfers certain powers and duties under the Lunacy Acts, 1890 and 1891, to the Board of Control,

Dr. MORRIS-JONES moved the deletion from the Schedule of Subsection (3) of Section 242, Subsection (4) of Section 243, and Section 250 of the Lunacy Act, 1890.

Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, said that if the amendment of Dr. Morris-Jones was carried it would mean that there would be no central control, either by the Board of Control or the Ministry of Health, over the functions of the local authorities. She was certain that that was not the hon. Member's intention, and therefore she asked him to withdraw.

Dr. MORRIS-JONES said that personally he was not afraid of the Board of Control to anything like the same extent as some members of the Committee. He thought, and was still of that opinion, that it would be a waste of time for local authorities to be obliged to submit contracts, agreements, and such matters of detail to the Board of Control, and that it would hamper schemes which were in hand. Nevertheless, he realised after hearing Miss Lawrence's explanation that his amendments went rather deeper than he had thought, and he would therefore withdraw.

The amendment was withdrawn.

On the question that the Second Schedule stand part of the Bill,

Dr. VERNON DAVIES said that the Schedule transferred to the Board of Control some very important duties, some of which he would be delighted to see handed over to the present Board. The new Board, however, as constituted under this Bill, had not his approval to anything like the same extent as the old one, and he anticipated some difficulty in the future with the local authorities in regard to the extension of bureaucratic control. In time to come reflections would be cast on that Committee for passing this Bill. He still hoped, however, that at a later stage the Minister of Health might be a little more amenable to argument and pressure, and might possibly meet them to a certain extent with regard to the powers of the Board of Control. If he did so, the Schedule would be admirable in every respect.

Mr. KINLEY said that he must oppose this Schedule in its present form. The step proposed was in the wrong direction, and cut across what had always been considered as the right and safe course of development in Government, both national and local; that was to say, that in the services which were definitely recognised as public services there should be a direct link between the local authorities and the central authority. They were now bringing in a third party, and giving it duties which had hitherto been rightly considered as duties which devolved on the central authority.

Mr. GREENWOOD, Minister of Health, said that the Committee had agreed to the transfer of these powers. They must not assume that the Board of Control had hitherto had negligible powers, and the Minister had had enormous powers; that was not the case. Under the principal Act the big powers had always resided in the Board of Control, and all that they were transferring now were matters of administrative detail in regard to which in the past there had been unnecessary duplication. The Royal Commission came to the conclusion that it was obviously absurd to have duplication of effort and the inevitable delay which it caused. Transfer in the other direction would mean the complete obliteration of the Board of Control under the principal Act. That was never contemplated. As they had reorganised the Board of Control under this Bill, and as it was quite clear from statements which had been made that it would always act in consultation with the local authorities, the fears of hon. Members were unfounded.

The Schedule was added to the Bill.

Rules.

On the Third Schedule, which deals with matters respecting which Rules may be made by the Board of Control,

Mr. GREENWOOD moved at the end of paragraph 3 to insert the words:

4. Applying to temporary patients received under Section 5 of this Act, subject to such modifications and adaptations,

if any, as appear to the Board to be necessary or convenient the following provisions of the principal Act, that is to say, Section 40 (which regulates the use of mechanical means of restraint), Section 41 (which relates to the letters of patients), Section 42 (which relates to the posting of notices), Section 47 (which relates to the visits of friends), Section 49 (which empowers the Board of Control to order the examination of a patient by two medical practitioners), Section 50 (which relates to inquiries as to property), Section 51 (which relates to searches in the records of the Board of Control), and Section 85 (which provides for the retaking of patients who have escaped).

5. Modifying and adapting, in relation to institutions maintained by local authorities not being mental hospitals, the provisions of Sections 275 to 278 of the principal Act (which relate to the making of general rules and regulations and the appointment and duties of certain officers).

He said that the first paragraph of the amendment was proposed as a result of representations made to his department that these provisions of the principal Act, which now applied only to certified patients, should apply also, with necessary adaptations, to temporary patients received under Clause 5. He hoped that these precautions would not be necessary in very many cases, but they were being inserted as an additional safeguard to the patient.

Dr. VERNON DAVIES said that he was not altogether prepared to agree that this amendment was an additional safeguard to the patient. What they were doing was to treat temporary patients as certified patients, while not calling them certified. That might be to the advantage of the patient, or it might not. For instance, the provision which regulated the use of mechanical means of restraint might be absolutely necessary, and he thought it should be in the Bill. The provision relating to the letters of patients did not appeal to him to quite the same extent, though it was probably a small point. The authorities would be acting illegally in keeping a definitely certifiable patient as a temporary patient, and perhaps the Board of Control should be given the power to order the examination of a patient by two medical practitioners. He could imagine, however, that it was likely to cause difficulty.

Mr. GREENWOOD said that the Sections in the principal Act were designed for the benefit of a person in a mental hospital. It was surely desirable that these forms of safeguard should apply to people who were only temporary patients. Section 49, which provided for the patient to be examined, did not necessarily mean certification, because the Section ended with the words: "the commissioners may order the patient to be discharged."

Dr. MORRIS-JONES said that when he first read the amendment he was rather inclined to think that they were treating the patients under Clause 5 as if they were certified lunatics, but on reading it more carefully he realised that it was necessary. At any moment these patients might be in such a state that they required in their own interests some of the safeguards which the Minister proposed.

The amendment was agreed to and the Schedule was added to the Bill.

Repeals.

On the fourth Schedule (Repeals),

Mr. GREENWOOD moved an amendment to provide that Section 229 of the Lunacy Act, 1890, should continue to operate in the case of voluntary patients who submitted themselves for treatment before this Act came into force. He said that if a person submitted himself for voluntary treatment on the understanding as the law now stood that he could secure his freedom at 24 hours' notice, it would be unfair to tell him that if he was under treatment after January 1st next he could not get out under 72 hours' notice. These people, however, would gradually disappear.

The amendment was agreed to.

The Committee stage of the Bill was concluded, and the Bill was ordered to be reported to the House.

HOUSING (SCOTLAND) BILL.

On April 3rd, Mr. WILLIAM ANDERSON, Secretary of State for Scotland, presented the Housing (Scotland) Bill, a measure "to make further and better provision with respect to the clearance or improvement of unhealthy areas; the repair, demolition, or closing of insanitary houses, and the housing of persons of the working classes in Scotland; to amend the Housing (Scotland) Act, 1925, the Housing, &c., Act, 1923, the Housing (Financial Provisions) Act, 1924, and other enactments relating to housing subsidies; and for purposes connected with the matters aforesaid."

SLUM CLEARANCE BILL.

In the House of Commons on April 7th Mr. GREENWOOD (Minister of Health), in moving the second reading of the Housing (No. 2) Bill (the main provisions of which were described in an article in THE LANCET last week), said that the problem of the slums was becoming more difficult year by year, partly because of the progressive decay of the old slums, and partly because of the deterioration in recent years of more and more property to the slum level. Progress in slum clearance had been deplorably slow. In the 30 years before 1919, 75 schemes were confirmed, of which 43 had been completed. The number of houses and other buildings in the confirmed schemes was approximately 15,000. The number of persons whom it was desired to rehouse was about 74,000. The number of houses that were to be built was 12,000; the number of houses that had already been demolished was between 8000 and 9000; and the number of houses actually completed during the ten years just closed was only 9743—a tragically small contribution to the solution of a problem which had become more serious within the last ten years.

Cumbersome Legal Machinery.

The first reason why they had not been successful in dealing with the problem was the complicated law and procedure at present necessary in order to get a clearance scheme through and completed. The machinery was too cumbrous to be effective. Apart from that difficulties had arisen from the decision of the courts in the case of Rex *v.* the Minister of Health *ex parte* Davis—what was known as the Derby case. The effect of that decision had been to hold up progress in many parts of the country. That was one of the matters dealt with in this Bill. The second obstacle to a successful attack on the slum problem was the existing grant and all that that involved. It was quite clear that the grant by the Ministry of Health of 50 per cent. of the estimated net annual loss was inadequate and placed too heavy a burden on local authorities. The meticulous and detailed supervision associated with the grant was both a discouragement to local authorities and an inevitable cause of delay. The third reason for their slow progress in recent years was that local authorities had in the forefront of their minds what he might call normal housing requirements, and their energies had gone in that direction. But the time had now arrived when, while pursuing building under the Act of 1924, local authorities should deal in a generous way with the problem of the slums. To enable them to do so it was clear that they must eliminate unnecessary procedure, secure more practical and less cumbrous arrangements, and give the local authorities greater freedom and greater financial assistance. It was important in addition to tighten up in some respects the existing law in order to make it more effective and also to enable local authorities to stop the degradation of new districts towards the slum level. That was broadly proposed in the Bill. Within the limited possibilities of reconditioning he hoped that the powers which the local authorities already had would be used. The Bill introduced rational reconditioning in a new way.

The Financial Aspect.

Dealing with the financial side of the Bill, Mr. Greenwood said that a grant-in-aid would be given to local authorities for dealing with clearance areas, improvement areas, and the demolition of individual houses, and the persons rehoused in any of these ways would be eligible for a grant. The grant was a grant per person—per man, woman, and child. The basis had been fixed so that the proportion of the cost borne by the local authorities should be diminished and the rate charge therefore proportionately reduced. The amount they had arrived at after consultation with the local authorities was 45*s.* per year for 40 years per person rehoused under this Bill. For agricultural districts the grant would be 50*s.* per person for 40 years. In London and one or two other places where conditions were such that a considerable amount of rehousing must take place on the site where the people were living, and there must be tenement provision, there would be an additional 25*s.* per person for 40 years. So far as rents were concerned, the local authority would be able to charge such reasonable rents as they thought fit and to differentiate according to the ability of the tenants to pay. He estimated that it would be possible in the normal case to let half the houses built under this Bill, on a broad average, at least 2*s.* a week less than the rent at present charged for houses under the existing scheme. That would make it possible to accommodate displaced persons, as to half of them at any rate, in houses where the rent would be as low as 5*s.* a week plus rates, and the other half in houses at rents of 7*s.* a week plus rates. That would mean a substantial relief to the hard-pressed slum-dweller. Part IV. of the Bill dealt with rural houses, and its object was to secure more energetic and comprehensive treatment on the rural housing problem.

An Opportunity for Local Authorities.

He hoped that the Bill would commend itself to the House and would be speedily passed into law. He hoped that the local authorities would seize the measure with both hands and extract from it 100 per cent. of what value it contained. He also hoped that with this new measure in their hands the local authorities would pursue to the very

end with real vigour, zeal, and determination the final conquest of the slums. If they did so they would have behind them the active support of a large body of public opinion. When the time came that every overcrowded family had a decent home, whatever it might have cost in treasure, the nation would have rid itself of a gigantic burden of disease, misery, and degradation, and would have done what it ought to have done before and have laid one of the essential foundations of civilised society—the home of the people.

An Unhappy Legacy.

Mr. NEVILLE CHAMBERLAIN said that Mr. Greenwood had treated this subject of slum clearance with an absence of party passion which he warmly welcomed because though on remedies there must, no doubt, be differences of opinion in the House, yet as to the urgency of the problem, the extent of it, and the necessity for finding some remedy all Members of the House were agreed. This generation did not make the slums; they were the unhappy legacy left to us from a time when the principles of public health were not understood and when the standards were very different from what they were to-day. To-day, however, public opinion and the public conscience were awake to the evil of the slums more acutely than ever before. The fact, however, that these conditions had been known to exist since the war, and had not been put right, was most eloquent testimony to the extraordinary difficulty of the problem which Mr. Greenwood was attempting to solve. It certainly had not been for want of trying. He agreed that when they considered the number of houses and persons whose conditions had been improved since 1919 under various slum clearance schemes they appeared deplorably and lamentably small. The worst feature of the slums was overcrowding. If there were no overcrowding the slum problem would be cut in half, and it was the recognition of that fact which since the war had caused the local authorities to concentrate nearly all their attention on the provision of new houses. Their efforts had been remarkably successful, but it was only within the past year or two that he had felt that the local authorities had been sufficiently relieved from the grinding pressure of building new houses to enable them to turn their eyes towards the problem of the slums with any prospect of success. The Bill was not what they had hoped for. It contained very little that was new, but he thought it would produce some effect. The Conservative Party would vote for the second reading and at subsequent stages try to make it a little better and more practicable than it was at present.

A Menace to Women and Children.

Miss LLOYD GEORGE said that the condition of many of the workmen's houses in the country districts was very bad. A report published some years ago showed that in her constituency of Anglesey the death-rate from tuberculosis for women was the highest but one in the whole of the administrative counties in England and Wales. Yet the death-rate for men, who were able to get out into the open air more than the women, was only 22. There could be only one explanation of that, and that was bad housing. The greater menace to the health of the women, who spent the greater part of their lives in dark and ill-ventilated cottages, applied also to young children. It accounted for the fact that in 1927 the infant mortality-rate in Anglesey was equivalent to 93 per 1000, which was alarmingly high.

General Support of M.O.H.'s.

After further debate,

Lieut.-Colonel FREMANTLE said he joined in the general feeling of the House that this Bill was a long overdue measure and one which called for the Council of State which the Prime Minister had so cordially asked all parties in the House to combine and create. He had the honour of speaking for the whole body of medical officers of health. As a past President of the Society of Medical Officers of Health, and as one who did perhaps as much as anyone before the war as a medical officer of health to bring before his colleagues in his profession the necessity for dealing with the housing problem, he spoke on their behalf, though without direct mandate, when he said that they wished the greatest measure of support to be given to this Bill in general and at the same time the most meticulous criticism of its details in Committee. They must be perfectly frank in dealing with this problem or they would not be able to deal with it. It was perfectly useless to compare the vital statistics of one slum area with those of the area surrounding it. People lived in the slums by reason of bad fortune of one kind or another. It was often a case of mental deficiency, heredity, and poverty.

Mr. LOGAN: Does the hon. Member suggest that the slum-dweller is a mental degenerate?

Lieut.-Colonel FREMANTLE asked the hon. Member to notice what he had said. Slum-dwellers included mental degenerates. People would not live in slums if they could help it. He believed that his opinion would be endorsed by medical officers of health. One of the greatest merits of this Bill was its continuity, that it really preserved a general continuity in regard to housing measures which were gradually getting to work. Medical officers of health generally throughout the country recognised that there had been an improvement in housing. They looked forward to the result of the census of next year which would tell exactly the state of overcrowding as compared with 1921. They would then have very definite data on which to proceed. Meanwhile, all the reports of medical officers went to show that there was an improvement in housing accommodation, although there had been a great change in the transportation and disposition of population. There had been a greater gravitation towards Greater London which had made the position in London more difficult. The same was true of other big centres. The Bill was supposed to enable them to close houses and to demolish slum areas and at the same time to build houses. He hoped that it might be so. Medical officers of health had been working for a long time on this question of closure and demolition of houses. Closing and demolishing orders had unfortunately been a dead letter since 1914 and the result was that in a recent report from the medical officers of health in England and Wales, of 2500 houses recommended for closing and demolition only 500 were demolished. That was because there was not a sufficient supply of new houses. No measure—not even the present Bill—would be any good unless it helped to provide new houses in which to rehouse persons removed from the slum areas. One very material reason for delay in clearing slum areas was the Rent Restriction Act which was not dealt with in this Bill. A very great difficulty had always been that where there was a recognised injustice under the law the local authorities would not put it into force. Medical officers of health would welcome certain parts of the Bill. In Clause 17 there was a very valuable power which enabled part of a house to be closed without closing the house altogether. There was also valuable provisions in the improvement clause which were really the only novelty in the Bill. The provision for the aged should be extended. The method of subsidy was also a valuable feature. It attacked overcrowding which was really the greatest difficulty of all.

The debate was adjourned.

The Financial Resolution.

On April 8th the debate on the second reading of the Housing (No. 2) Bill was resumed.

The second reading was agreed to without a division.

The House then went into Committee on the financial resolution in connexion with the Bill.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that the Government did not give any estimate of the cost of the scheme because they did not know what the cost would be. If the response of the local authorities was satisfactory the cost would be very great. If, on the other hand, the scheme was a failure it would cost nothing.

The resolution was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 2ND.

Ministry of Health and Test Work.

Mr. HORE-BELISHA asked the Minister of Health whether he proposed to publish the Report of the Ministry's inspectors on the position of test work.—Mr. GREENWOOD replied: I propose to publish the report on the inquiry.

Scientific Inquiry on Anthrax.

Dr. SALTER asked the Home Secretary whether he was now in a position to present an interim report upon the investigations carried out by the Scientific and Industrial Research Committee on the disinfection of hides and skins from anthrax.—Mr. SHORT, Under Secretary to the Home Office, replied: These investigations are being carried on not by the Department of Scientific and Industrial Research, but by the British Leather Manufacturers' Research Association, but some account of the progress of the research is given on page 130 of the recently published annual report of the department for 1928–29 (Cmd. 3471). I understand that a full account of the results will probably be published in a scientific journal, but my right hon. friend proposes to consult with the Association as to whether some advance statement should not be issued, and he will communicate the result to my hon. friend in due course.

THURSDAY, APRIL 3RD.

Marriage of Mental Defectives.

Mr. SORENSEN asked the Minister of Health whether he had any information respecting the marriage of mental defectives and their offspring; and whether he contemplated

taking steps to prohibit such marriages.—Mr. GREENWOOD replied: References have been made to this matter from time to time in the reports of the Board of Control. Legislation would be necessary in order to prohibit the marriage of mental defectives; and I cannot at present undertake to introduce a measure for this purpose.

Colonies for Mental Defectives.

Mr. SORENSEN asked the Minister of Health how many colonies for mental defectives existed in England and Wales; the total number of patients and attendants respectively; and the total cost; and whether he contemplated encouraging the further establishment of these colonies.—Mr. GREENWOOD replied: There are 35 institutions certified under the Mental Deficiency Acts which may be regarded as colonies, but they are in widely divergent stages of development. The total number of patients is at present 16,592, but I am not in a position to state the number of attendants or the total cost. The cost of colonies is under consideration by a committee recently appointed, and their advice must have a bearing on the question of further provision of accommodation of this type.

Board of Control and Mental Treatment.

Mr. KINLEY asked the Minister of Health the average number of patients per doctor in the institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: As regards institutions under the Lunacy Act, the average number of patients to each member of the resident medical staff is: (*a*) in county and borough mental hospitals, 280; (*b*) in registered hospitals, 61; and (*c*) in licensed houses, 35. Most of these institutions have, in addition to their resident staff, a number of visiting consultants. In mental deficiency institutions the average number of patients to each member of the staff, resident and non-resident, is 111.

Mr. KINLEY asked the Minister of Health the number of institutions under the jurisdiction of the Board of Control in which the approved accommodation was in excess of normal requirements; and what was that excess.—Mr. GREENWOOD replied: There are 44 local authorities under the Lunacy Act who have accommodation in excess of that required for patients within their own area; and the total number of beds is at present 5272. Most of this surplus accommodation is, however, occupied by patients received under reception contracts from other local authorities who have insufficient accommodation or do not own a mental hospital. I am informed that private institutions under the Lunacy Act have sufficient vacant beds to meet normal requirements. In the case of mental deficiency institutions there is no accommodation in excess of normal requirements.

Mr. ROBERT RICHARDSON asked the Minister of Health in how many instances during the past year the Board of Control, in fulfilling their duty of scrutinising documents of certification had discovered that no reason had been stated (as required by Section 32 of the Lunacy Act, 1890); as to why the usual medical attendant of the patient had not been consulted; if he was aware that the omission to give this reason constituted a contravention of an important safeguard; and if he would see that in future that no such omission was allowed to pass unnoticed.—Mr. GREENWOOD replied: Statistics are not available in regard to this point. But the omission to which my hon. friend refers is a contravention of Section 31 of the Lunacy Act, and the Board of Control return for insertion of the necessary particulars all reception documents which do not comply with the requirements of that Section.

State Grant for Medical Research.

Dr. FORGAN asked the Secretary to the Treasury, in view of the inadequacy of the present endowment of medical research, what action he proposed to take to increase the amount of the annual grant in aid.—Mr. PETHICK-LAWRENCE replied: The present annual grant in aid of the Medical Research Council is £148,000, and I have no reason to think that it is inadequate. My hon. friend must understand that this is by no means the only contribution made by the State to medical research.

Imported Milk and Tuberculosis.

Brigadier-General CLIFTON-BROWN asked the Minister of Health the amount of liquid milk and liquid cream imported into this country in 1929; from what countries they came; and what precautions were taken to see that they were free from tuberculosis.—Mr. GREENWOOD replied: I am informed that 58,460 cwts. of milk and 138,604 cwts. of cream were imported into Great Britain and Northern Ireland in 1929. All the milk, except 406 cwts. from Denmark and the Netherlands, came from the Irish Free State. I am sending the hon. Member a statement showing the countries from which the imports of cream were received. Imports of milk from outside the British Islands are subject to examination for tubercle under the Imported Milk Regulations. There is no examination of imported cream for this purpose.

Small-pox Contacts and Vaccination.

Mr. GROVES asked the Minister of Health if he would issue a memorandum to public medical officials deprecating the vaccination of persons who had been in contact with small-pox, seeing that in cases where the small-pox had already been contracted the operation could only add to the patient's troubles, and in those cases where it had not been already contracted after such exposure the imposition of the operation was, ipso facto, unnecessary.—Mr. GREENWOOD replied: No, Sir. I do not think that I should be justified in adopting the course suggested. I am advised that vaccination, if performed sufficiently soon after exposure to small-pox infection, usually prevents an attack of the disease. If vaccination is performed too late to prevent the disease being contracted it may, nevertheless, modify the severity of the attack.

Management of London Lock Hospital.

Mr. ERNEST BROWN asked the Minister of Health if he was now in a position to announce the reforms undertaken by the board of the Lock Hospital; whether any women had been appointed to its governing board; and, if so, what were their names.—Mr. GREENWOOD replied: The governing body of this hospital have given effect to a number of the recommendations contained in the papers presented to Parliament last July, and I understand that further improvements are in contemplation. I do not consider that the best interests of the hospital would be served by publishing details at the present time of the reforms already effected. As regards the remaining parts of the question, the board of management of the hospital includes the following ladies: Mrs. Hatfeild, J.P., Councillor Mrs. Hendin, J.P., Commissioner Mrs. Lamb, J.P., Lady Leitrim, Miss E. E. MacNeill, and Miss Mowll.

Psittacosis.

Mr. GRAHAM WHITE asked the Minister of Health the number of cases of psittacosis notified during the month of March.—Mr. GREENWOOD replied: Psittacosis is not a notifiable disease, but my department has received information of 20 cases of illness which commenced last month, and in which the patients had been associated with sick parrots. I am advised, however, that in the present state of knowledge of psittacosis it is not possible to say definitely how many of these persons were in fact suffering from that disease.

Birth Control Information.

Mr. R. S. YOUNG asked the Minister of Health whether it had been reported to him by his medical officers that there were any demands or requests for birth control information from mothers at subsidised welfare centres.—Mr. GREENWOOD replied: Such requests are only occasionally reported by the medical officers of the department.

Lead Paint Prosecutions.

Mr. MCKINLAY asked the Home Secretary the number of prosecutions arising out of the evasion of the Lead Paint Regulation.—Mr. CLYNES replied: These regulations came into force on Oct. 1st, 1927, and no prosecutions were taken in that year. During 1928 and 1929 and the first three months of 1930 proceedings were taken in respect of 33 contraventions and convictions obtained in 31 cases.

MONDAY, APRIL 7TH.

Conditions in Boot Industry in East London.

Mr. MALONE asked the Home Secretary whether he had received the report on conditions of employment in the boot industry in the East End of London, prepared by Dr. A. D. Denning for the Boot Manufacturers' Federation and the National Union of Boot and Shoe Operatives; and, if so, what action he proposed to take.—Mr. CLYNES replied: Yes, Sir. I have now received and perused this report. I find that it draws a most unfavourable picture of the conditions under which this industry is carried on in the East End of London, but that, so far as concerns matters within the purview of my department, the conclusions appear to be based not on facts ascertained by personal observation of the conditions at the works concerned, but almost entirely on impressions derived from unverified ex parte statements. I understand that though Dr. Denning was offered facilities by the Factory Department for the purposes of his investigation he has never discussed the position with the department, and the chief inspector informs me, after consulting the whole of the staff in the districts concerned, that they are unanimously of opinion that the report gives a very exaggerated account. I find also that the report contains statements conveying serious reflections not only on the competency of the factory inspectors, but also on their attention to duty and even on

their honesty—as, for example, that the inspectors have favoured Jewish as against British employers, and that they are open to accept bribes. These allegations which, unless supported by detailed and reliable evidence, ought never to have been put forward, are strongly repudiated by the staff, and I cannot but express my surprise and regret that a report containing such allegations and compiled on the basis I have indicated should have obtained currency before any attempt had been made to subject the accuracy of the statements it contains to an independent test. I understand that the report has now been considered jointly by the Federation of Boot Manufacturers and the National Union of Boot and Shoe Operatives, and that a committee has been appointed to consider what steps should be taken. The chief inspector informs me that he has been invited, and has agreed, to attend a meeting of this committee, and I propose to await the result of that meeting before considering what action, if any, it behoves me to take.

Inspection of Imported Meat.

Mr. THORNE asked the Minister of Health if he was aware that the examination of Argentine mutton for caseous lymphadenitis was becoming less stringent in all centres outside the City of London; that in the ports of London, Liverpool, and Southampton the work of cutting and examining the glands of the sheep was left to dock workers or employees of the importing firms; that carcasses had been passed by the port sanitary authority and afterwards condemned by the City of London inspectors; and whether he was prepared to issue a circular instructing port medical officers to carry out examinations effectively.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the negative. My right hon. friend understands that at some ports skilled men are specially employed whose business it is to cut and expose glands for inspection by officers of the Port Sanitary Authority. With regard to the third part of the question, my right hon. friend is informed that it is not the practice at the Port of London to inspect meat which is destined for the city markets, and will be inspected there. A conference between the medical officers of health of the ports principally concerned and officers of my department took place recently, and the conclusion was reached that no relaxation should be made of the present arrangements for examination. My right hon. friend does not think that any circular on the subject is required at present.

TUESDAY, APRIL 8TH.

Medical Experts and Seven-year Limit Pension Cases.

Mr. GRAHAM WHITE asked the Minister of Pensions the number of seven-year limit cases submitted to the independent medical experts and the results.—Mr. F. O. ROBERTS replied: Up to date about 25 cases of material doubt or difficulty have been or are being referred to the independent medical consultants for consideration and advice, but not more than nine of these have so far been decided, with results unfavourable to the claimants. These figures are not, however, representative as the new arrangements have only quite recently reached their full operation. I may add that during the same period 227 applications have been admitted without reference to the consultants.

Extension and Coördination of Insurance Services.

Mr. MCENTEE asked the Minister of Health whether he was considering the extension and coördination of the national insurance services; and whether he would include in any new legislation for that purpose facilities for small shopkeepers and business men with limited incomes to become voluntary contributors for health purposes.—Miss S. LAWRENCE replied: These matters come within the scope of the Cabinet Committee engaged on a general survey of the existing insurance and pensions legislation.

BELLE VUE SPA, TREFRIW, NORTH WALES.—New pump rooms at this spa, where all forms of arthritis are treated, are to be opened on April 26th by Sir W. Arbuthnot Lane, supported by Dr. R. Fortescue Fox.

RESIDENTIAL SPECIAL SCHOOLS.—The Shaftesbury Society and Ragged School Union is extending the Victoria Home for Crippled Children, Bournemouth, so as to receive 20 more children from 2 years and upwards, following their hospital treatment. The accommodation at the Russell Cotes School of Recovery for delicate children at Parkstone has been increased by 30 more beds. The accommodation in the four seaside residential schools certified by the Board of Education will then be enlarged to 270 places.

Medical News.

UNIVERSITY OF BRISTOL.—At a recent examination the following candidates were approved:—

M.D.—J. F. O. Bodman and T. F. R. Hewer.

LONDON CLINICAL SOCIETY.—A clinical meeting of this society will be held on April 15th at the London Temperance Hospital, where cases will be on view from 8.30 P.M.

ROYAL LONDON OPHTHALMIC HOSPITAL.—The Gifford Edmonds' Prize for 1930, offered for an essay on Central Scotoma, its Pathology and Clinical Significance, has been divided between Dr. Rosa Ford and Miss Laura M. Ligertwood, F.R.C.S.

PRESENTATION TO DR. JOSEPH BEARD.—Dr. Beard, of Carlisle, who has retired from the medical officership of the town, was, on April 1st, presented at a representative gathering of citizens with a casket and cheque in recognition of his 22 years' service.

NATIONAL SMOKE ABATEMENT SOCIETY.—A public conference on by-laws under Section 5 of the Public Health (Smoke Abatement) Act, 1926, will be held on May 2nd at 71, Eccleston-square, Westminster, S.W., at 3.30 P.M. The discussion will be opened by a paper to be read by Mr. C. J. Allpass, chairman, Public Control Committee, London County Council.

INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL.—The programme of the year's course of lectures on Pathological Research in its Relation to Medicine has reached us. The lectures will be given as usual in the lecture room of the bacteriological department of the Institute on Thursday afternoons at 5 P.M., beginning on April 24th, when Sir Almroth E. Wright will lecture on Twelve Years' Work on Immunisation of the Blood in vitro. Subsequent lectures will be as follows: May 1st, Prof. John Mellanby, Absorption from the Alimentary Canal. 8th, Dr. W. E. Gye, the Action of Antiseptics on the Virus of Filtrable Tumours. 15th, Dr. Leonard E. Hill, the Physiology of Diving. 22nd, Prof. C. A. Lovatt Evans, Stages in the Investigation of the Physiology of the Heart. 29th, Sir Thomas Lewis, Reactions of the Skin to Cold. June 5th, Prof. G. E. Gask, the Value of Radium in Surgery; 12th, Colonel L. W. Harrison, Development of the Modern Treatment of Syphilis.

MEDICAL SUPERINTENDENTS' SOCIETY.—The annual dinner of this society took place at the Holborn Restaurant on March 28th, Dr. E. W. G. Masterman, president of the society, being in the chair. Amongst the 93 members and guests present were Dr. Barrie Lambert, chairman of the Central Health Committee, London County Council; Dr. W. Allen Daley, Dr. J. Brander, and Dr. J. A. H. Brincker, principal medical officers of the Council; and Dr. J. J. Buchan, president of the Society of Medical Officers of Health. Dr. Daley, in proposing The Society, recalled incidents in its 43 years' history. Dr. Masterman, in reply, said the name of the society had been changed so as to include medical superintendents of all public hospitals and of voluntary hospitals and whole-time medical officers in responsible charge of patients in public hospitals or institutions for the sick. Dr. Lambert, replying for The Guests, emphasised the need for coöperation between medical superintendents and the London County Council in its enormous task. Dr. Buchan spoke of liaison between the curative and preventive sides of medicine.

SEAMEN'S HOSPITAL SOCIETY.—A dinner was held at the Mansion House, London, on April 8th, in aid of the funds of the Hospital for Tropical Diseases, Endsleigh-gardens. The Duke of York, who presided, said that the work of the hospital fell into three main sections: treatment, research, and education. In addition to officers and men of the Mercantile Marine, persons of every race, nationality, and creed received treatment. Research into the causation and prevention of tropical diseases carried on in the laboratory of the hospital had resulted in discoveries which had rendered habitable vast tracts of country, while the instruction given to members of the medical profession destined to practise in the tropics carried expert knowledge to every corner of the tropical world. The new lecture theatre would be known as "The Manson Clinical Lecture Theatre" to remind students of the source of inspiration from which their knowledge sprang. The necessary alterations and extensions to the hospital would cost £35,000. Lord Passfield praised the work of the School of Tropical Medicine, Sir Arthur Clarke and Dr. G. Carmichael Low replied. Sir Leslie Wilson announced that promises for £10,000 had been handed to the Duke of York during the evening.

BOMBAY MEDICAL COUNCIL.—At a meeting of the Council held on Feb. 10th, Major-General W. H. C. Forster, I.M.S., the new President, was introduced to the Council by Sir Temulji Nariman.—The Council resolved to recognise as an additional qualification the Diploma in Ophthalmology now granted by Bombay University.

ROYAL SANITARY INSTITUTE.—A meeting is to be held on May 2nd, in the Town Hall, Tunbridge Wells, when discussions will take place on the Maternity Home as a Health Asset, to be opened by Dr. F. Churchill Linton, and on Can the Slum be Abolished? to be opened by Mr. H. T. Taylor.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The sixteenth annual conference will be held on July 3rd, 4th, and 5th next, in the British Medical Association House, London. It is proposed to concentrate attention on the effects on the Tuberculosis Campaign of the Local Government Act, 1929. The subject will be introduced by Sir George Newman, followed by Dr. John Parlane Kinloch.

ROLLER SKATING ACCIDENTS.—The Board of Management of Worksop Hospital has decided that patients suffering from accidents while roller skating shall not, in future, receive free treatment, even although they are members of the Contributory Scheme.

EAST LONDON HOSPITAL FOR CHILDREN.—At the annual meeting of this hospital last week Sir Percy Shepherd, who presided, pointed out that the completion of the buildings could no longer be postponed, the accommodation for the nursing staff alone having been severely criticised by King Edward's Fund as totally inadequate to modern requirements. The work will cost £25,000.

SCUNTHORPE ISOLATION HOSPITAL.—This hospital at Brumby, near Scunthorpe (Lincs.), was opened last week by Lord Heneage, the chairman of the Lindsey County Council. The accommodation includes a scarlet fever block, a cubicle block of eight beds separated by glass partitions for other fever cases, a tuberculosis pavilion, and a children's playroom.

THE DIFFICULT CHILD AS A MEDICAL, SOCIAL, AND PSYCHOLOGICAL PROBLEM.—A series of six lecture-discussions on this subject will be delivered by the officers of the Child Guidance Clinic of the Jewish Health Organisation of Great Britain, on Mondays and Thursdays, at 5.15 P.M., beginning on May 19th. The meetings will take place at Toynbee Hall, Commercial-street, London, E. Dr. F. C. Shrubsall will take the chair at the first lecture, on the General Nature and Scope of the Problem and its Treatment, which will be delivered by Dr. Emanuel Miller. Dr. Noel H. M. Burke will speak on the Management of a Clinic on May 22nd and on Physical Factors on June 2nd. Dr. Emanuel Miller will give the concluding lecture on the Rôle of the Psychiatrist on June 5th. Tickets for the course, which is meant chiefly for officers and workers connected with schools, homes, and clubs in the East End of London, may be obtained from Child Guidance Clinic, Jews' Free School, Bell-lane, Spitalfields, London, E.

Medical Diary.

SOCIETIES.

CHELSEA CLINICAL SOCIETY.
TUESDAY, April 15th.—7.30 P.M., Dinner at the Hotel Rembrandt, Thurloe-place, S.W., followed by a discussion on Coughing. Openers: Dr. R. A. Young and Mr. Philip Franklin.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, April 14th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Med., Surg., Nose, Throat, and Ear Clinics. Operations.
CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 15th.—5 P.M., Mr. A. L. Walker: The Management of Toxæmias.
CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.
FRIDAY, April 18th.—4 P.M., Mr. J. D. McLaggan: The Indications for the Removal of Tonsils and Adenoids in Children.
GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 16th.—4.15 P.M., (at the Western Infirmary), Dr. John Gracie: Medical Cases.
MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, April 15th.—4.15 P.M., Mr. J. Howson Ray: Hydatid of the Liver.

Appointments.

ADAMSON, A. F., M.D., Ch.B. Edin., has been appointed Medical Officer of Health, Hendon.
ADAMSON, OSWALD J. W., L.R.C.P. Lond., M.R.C.S., Honorary Clinical Assistant to the Ophthalmic Department, Royal Sussex County Hospital, Brighton.
BAINBRIDGE, MARION L., M.B., Ch.B. Manch., Asst. Welfare Medical Officer, Durham County Council.
COLVILLE, E. T., M.D., B.S. Durh., D.P.H., Medical Officer of Health, Bridlington.
DRURY, K. K., M.D., B.Ch., D.P.M. (T.C.D.), Medical Superintendent of the Leicester and Rutland Mental Hospital, Narborough, nr. Leicester.
KELLY, D. H., M.B., B.Ch., N.U.I., House Surgeon, North Riding Infirmary, Middlesbrough.
MORLEY, J., M.B., Ch.M. Manch., F.R.C.S. Eng., Lecturer in Systematic Surgery in the University of Manchester.
PURCE, G. R. B., M.B., M.Ch. Belf., D.P.H., Hon. Asst. Surgeon, Royal Victoria Hospital, Belfast.
RAYNER, E. C., M.B., B.Ch. Camb., Certifying Surgeon, under the Factory and Workshop Acts for the Hythe District of the County of Kent.
Queen Charlotte's Maternity Hospital: JENNINGS, H. T., M.B., Ch.B., F.R.C.S.E., Senior Resident Medical Officer; FLEW, J. D., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer; WRIGHT, ELSIE, M.B., B.S. Lond., District Resident Medical Officer; PARSONS, FLORENCE, M.R.C.S., L.R.C.P. Lond., Resident Anæsthetist.
Certifying Surgeons under the Factory and Workshop Acts: CHILLINGWORTH, H. F., L.R.C.P. Lond., M.R.C.S. (Bodmin, Cornwall); and LATHAM, T., L.R.C.P. Lond., M.R.C.S. (Sandbach, Chester).
Medical Referees under the Workmen's Compensation Act: ALCOCK, A., M.B., B.S. Lond. (Circuit 53); GEDDIE, M.B., Ch.B. Aberd. (Circuit 4); and STALKER, J. M., M.B., Ch.B. St. And. (Dundee District of Forfar.)

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Two H.P.'s and Two H.S.'s.
Aden Settlement, Arabia.—M.O.H. 800Rs. per mensem.
Alberta, Canada.—Municipal Doctor. $2000 per annum.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.
Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.
Basingstoke, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.
Bath, Royal United Hospital.—H.S. Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Beit Memorial Fellowship for Medical Research.—Jun. Fellows. £400.
Birmingham General Hospital.—H.P. £70.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bournemouth County Borough.—Asst. M.O., &c. £650.
Bradford Royal Infirmary.—H.P. and H.S. Each £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
British Guiana, Georgetown.—M.O.H. £800.
British Medical Association.—Asst. Med. Secy. £1000.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Burton-on-Trent General Infirmary.—H.S. £150.
Cardiff Royal Infirmary.—Aural H.S. At rate of £75.
Carshalton, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Charing Cross Hospital, W.C.—Physician for Mental Disorders.
Chester Royal Infirmary.—Hon. Surgeon.
***Connaught Hospital, Orford-road, E.*—Sen. Res. H.S. At rate of £150. Jun. Res. H.S. At rate of £100.** Also M.O. for Electro-therapeutic, &c., Depts.
Dundee Royal Infirmary.—Two Asst. Visiting M.O.'s
Durham County Council.—Asst. M.O. for Public Services. £800.
Durham County Hospital.—Jun. H.S. At rate of £120.
East London Hospital for Women and Children, Shadwell, E.—Cas. O. At rate of £125.
Edinburgh Corporation.—M.O.H. £1500.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. Radiologist. £100.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.
Folkestone Borough.—Asst. M.O.H. £600.
Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
Halifax Royal Infirmary.—First H.S. also Third H.S. At rate of £175 and £100 respectively.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. At rate of £100.
Harrogate General Hospital.—H.P. £150.
Hong-Kong.—Medical Officers. £600.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Res. M.O. for Country Branch Hospital, Tadworth. At rate of £250.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hove, Lady Chichester Hospital.—Jun. H.P. £50.
Huddersfield County Borough.—M.O.H., &c. £1100.
Hull Royal Infirmary.—H.S. to Spec. Depts. At rate of £150.
Indian Medical Service.—Commissions.
Inverness, Northern Infirmary.—H.P. £100.
Kenya Colony Government.—Laboratory Asst. for Med. Dept. £354–£500.
Leicester, City Mental Hospital, Humberstone.—3rd Asst. M.O., and Asst. Pathologist. £600.
Liverpool, Royal Southern Hospital.—H.S. and M.O. Each at rate of £60.
London Hospital, E.—Radiologist.
London Royal Free Hospital, School of Medicine for Women.—Demonstrator in Pathology. £250.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—1st Asst. in Clin. Lab. £350. 2nd Surg. Reg. £150. Also Asst. M.O. for Massage and Electrical Dept. £100.
Medical Inspectors of Factories.—£600.
Montrose Royal Asylum.—Asst. M.O. £325.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S. Also Res. Sen. H.S. At rate of £100 and £95 respectively.
Nottingham General Hospital.—2nd Cas. O. At rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—Asst. S. Also Surg. Reg.
Preston and County of Lancaster Royal Infirmary.—H.S. At rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P. Also Hon. Surg. Reg. £100.
Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. Also H.P. At rate of £100.
Royal College of Surgeons of England.—Examiners in Anatomy and Physiology, Dental Surgery. Also Examiners under the Conjoint Examining Board in England.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Helen's Hospital, Lancashire.—Res. M.O. £250.
St. John's Hosp., Lewisham, S.E.—Res. Cas. O. At rate of £100.
St. Mary's Hospital, Institute of Pathology, &c.—Research Studentship.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.—H.S. At rate of £100.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæs. thetist. Each at rate of £80.
Southampton, Free Eye Hospital.—H.S. £150.
Stafford County Mental Hospital.—2nd Asst. M.O. £600.
Stockport Infirmary.—H.P. £175.
University College Hospital Medical School, W.C.—Chair of Bacteriology. £1200.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Surgeon-in-charge of Orthopædic Dept.
Wolverhampton Royal Hospital.—Cas. O. and Res. Anæs. At rate of £125.
Worcestershire County Council.—Asst. County M.O. £600.
Worksop, Victoria Hospital.—H.S. At rate of £170.
York, Bootham Park.—Jun. Asst. M.O. £300.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Llanybyther (Carmarthenshire), Maiden Newton (Dorsetshire), Tenbury (Worcestershire), Whitstable (Kent), and Pontypool (Monmouthshire).

Births, Marriages, and Deaths.

BIRTHS.

BURN.—On April 4th, at Gayton-road, Harrow, the wife of J. H. Burn, M.D., of a daughter.

HEWER.—On March 29th, 1930, at 32, Park Village East, Regents Park, to Phœbe, née Champney, wife of Christopher Langton Hewer, M.B.—a son.

ROMANIS.—On April 3rd, at Harley-street, W., the wife of W. H. C. Romanis, F.R.C.S., of a daughter.

VINT.—On April 1st, at "Oaklands," Langton Green, Tunbridge Wells, the wife of Dr. M.D. Vint, of a daughter.

MARRIAGES.

BATHO—GARRETT.—On April 2nd, at the Parish Church Eastleigh, Hants, Edgar Richard Batho, M.C., M.R.C.S. Eng. L.R.C.P. Lond., to Marion Josephine, only child of Dr. and Mrs. R. Reynolds Garrett, of Eastleigh.

DEATHS.

BERGIN.—On March 31st, William M. Bergin, M.B., B.S., F.R.C.S. Edin., of Hanbury-road, Clifton, Bristol, Director of Ashley Down Orphan Homes.

MELLISH.—On March 30th, at Coombe House, Tetbury, Glos., after five years' illness, John Stafford Mellish, M.R.C.S., L.R.C.P., aged 65.

PARRY.—On April 6th, at Park-road, Curzon Park, Chester, Thomas Sharp Perry, M.B., B.S. Lond., M.R.C.S. Eng., L.S.A., in his 81st year.

REYNOLDS.—On Sunday, March 30th, Austin Edward Reynolds, M.R.C.S. Eng., &c., of The Common, Woolwich, and of Finsbury-chambers, E.C., aged 63.

WATT.—On April 2nd, Sir GeorgeWatt, C.I.E., M.B., C.M. Glasg., at his residence at Lockerbie, Dumfriesshire, a few days before completing his 79th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

DANIEL MALTHUS, APOTHECARY, 1651–1717.

BY R. R. JAMES, F.R.C.S.

Daniel Malthus was son to Robert Malthus, Vicar of Northolt, Middlesex, and Sarah, his wife, and was baptized at Northolt on Feb. 15th, 1651. The father was ejected from his living in 1662. According to Calamy "Nonconformists' Memorial" (ii., 460) he was "an ancient divine, a man of strong reason, and mighty in the scriptures, of great eloquence and fervour, though defective in elocution." His parishioners found him so obnoxious that they petitioned Cromwell for his removal, but without effect. He appears to have had a great propensity for engaging in Chancery suits, which bears out the opinion expressed by his parishioners, that "their vicar was fully as partial to the law as to the gospel."

I know nothing of Daniel's early life, but find that he was made free of the Company of Apothecaries in 1678. From Barrett's "History of the Society of Apothecaries" we learn that "in 1704 Mr. Daniel Malthus, the Queen's Apothecary, had prior to the proceedings been called on to the Court of Assistants in virtue of his position. He was then immediately elected Master, but pleading pressure of business was, after paying a fine of £50, excused at present." Morant, "History of Essex," ii., 543, states that he was "apothecary to the very learned Dr. Sydenham, on which account he caused his son to be named Sydenham, and was afterwards Apothecary to King William and Queen Anne. He married Elizabeth, daughter of John Portman, Esq., and had by her, Sydenham Malthus, Esq., his son and heir, one of the six clerks in Chancery and a director of the South Sea Company in 1741."

Daniel Malthus must have prospered in his business, for we find him by indenture dated Dec. 19th, 1702, buying the manor of Hadstock for the sum of £5500 from James Earl of Suffolk (Close Roll, Anne). Sydenham thought highly of Daniel Malthus, for by his will, proved Jan. 4th, 1690, he desires to be buried where his executor and Daniel Malthus shall think convenient. After naming him as one of his trustees, the will continues: "I also give to the said Mr. Malthus, £20 to buy him a piece of plate in remembrance of me, desiring the said Daniel Malthus, for the consideration I have always reposed in him, and the integrity and friendship he hath born to me and my family, and for that he would be assisting to my son William and his family with the best advice and counsel he can give." Malthus was also named a trustee to Sydenham's grandchildren and was bequeathed £10 per annum for his trouble, this sum was, by codicil, reduced to £5 owing to the reduction of the estate of the legatees. Malthus was Sydenham's neighbour in Pall Mall.

Daniel Malthus's Letters.

The following letters are among the Sloane MS. at the British Museum, and are worth reproducing. I have arranged them in chronological order as far as possible.

Sloane MS. 4036. *f.* 279.

SR,—I came to tell you that Mr. Randall's daughter hath used the lotion four nights, and says the pimples are more in number, and larger than they were. If you expect the humour should come out more upon this application, she is contented, but thought fit you should be acquainted with it, I will call here some time tomorrow, if you please to leave order what you will have done or word that you intend to see her, I will give Mr. Randall an account of it.

I am, Sr. yr. humble Servt.,
D. MALTHUS.

Dec. 18, 96.

The next letter is undated, but would appear to belong to the same case.

Sloane MS. 4077. *f.* 61.

SR,—The pimples in Misses face begin to returne, and rather in greater number then before, which much discourages the mother, she speaks of some powder that a friend of hers used by your appoyntment which did cure. I tolde her it was fit you should see it, but she bid me first send you word of it.

I am, Sr., yr. humble Servant,
D. MALTHUS.

Sloane MS., 3041, *f.* 302.

SR,—Dr. Warth and Mr. Shale, attorney are made Comrs. to take care of Sr. Ed. Hannes person, and his Br. in law Mr. Packer for his daughter and estate. They begg of you to consider in wt way it will be best for him to be managed as to Government, lodging, dyet and Physic, and that you will appoint where and when they may receive your advice herein.

I am, Sr. yr. humble Servant,
DANIEL MALTHUS.

Feb. 25, 1708.

Sloane MS., 4041, *f.* 178.

For Dr. Sloane in Bloomsbury Square,

SR,—I am greatly obliged to you in having my health and that of my spouse in your thoughts, for which we returne you our thanks. I thanke God I have recovered my appetite and am in perfect health; and my wife hath been free from spitting of blood and so much better of her cough as to leave off diacodium: however, I hope to persuade her to submit to what you advise as the best thing she can do to preserve her. Sr. Richard Blackmore was here yesterday, and found all as you did: I did not see him, but was told so by Dr. Arbuthnott, who gives his service to you. Her Hs. took the purge today, but I have not yet directions to pursue the rest of the course.

I am, Sr, yr. obliged humble servant,

Windsor Castle, July 10, 1708. DANIEL MALTHUS.

Sloane MS. 4076, *f.* 106.

For Dr. Sloane in Bloomsbury Square.

SR,—Dr. Arbuthnott hath been three days afflicted with a violent cholick with vomiting and pains in his back, which gives him suspicion of stone or gravel, though all his bowells seem affected. Her Majesty order'd that a Physician whom she should chuse should be sent for. He beggs the favour of you, and that you will bring Dr. Oliphant with you, of which I have given him notice, he lives in a new court between Windmill Street and Rupert Street, I thinck it is called Panton Court. I have by his direction acquainted Sr. Rid. Blackmore with his condition, and desired his advice, which will be brought you by the bearer if he meets him, but you will please not to tarry for that, he hath used purging and glysters with Venice treacle and with terpentine and Laudanum. I received your letter and gave Mr. Polter an account of it.

I am, Sr, yr. obliged humble servt.,

DANIEL MALTHUS.

Windsor Castle, Octob. 7, 1709, near 9 in ye forenoon.

(*In the margin*) Pray let the bearer carry Dr. Oliphant word when you will call him.

Sloane MS., 1968, *f.* 2.

SR,—Her Matys. fitt of ague returned this afternoon, and Her Maty. ordered me to desire you to meet her Physicians at the back stairs at eight of the clock tomorrow morning.

I am, Sr, yr. humble Servant,

March 9, 1710/1. DANIEL MALTHUS.

Sloane MS., 4076, *f.* 108.

SR,—Dr. Lawrence and Dr. Arbuthnott begg the favour of you to be at Dr. Arbuthnott's Lodging in St. James's house at eleven a clock in the forenoon tomorrow.

I am, Sr, yr. humble Servant,

May 28, 1713. DANIEL MALTHUS.

Sloane MS., 4043, *f.* 157.

For Dr. Sloane, Her Majesty's Physician in Bloomsbury Square.

SR,—Dr. Arbuthnott desired me to acquaint the phisicians that Her Majesty is very well, but that they were desired to meet at his lodging in St. James's House tomorrow at such time, as they found most convenient. I was with Dr. Laurence, who would accommodate himself to you, but since no time is set he names twelve, unless you should all agree on any other time, and in that case he desires notice may be sent of it to me, and he will comply with it.

I am, Sr, yr. humble servant,

June 25, 1713. DANIEL MALTHUS.

Queen Anne died on August 1st, 1714, three years before her apothecary. Money was owing to him from the royal estate. Treasury Papers, 245, 2, at the Public Record Office give: 18 February, 1722/3. "That there is due from Her late Majesty Queen Anne to the executors of the late Daniel Malthus, Apothecary to her said late Majesty's person, the sum of £301 17*s.* 4¼*d.*—i.e., on his allowance of £320 *5s.* per annum from Xmas 1713–1, August 1714, the sum of £192 7*s.* 4¼*d.*, and on his bills for medicine for the family and other persons at Windsor, etc., and for Spaw water bought by H.M.'s particular order, £109 10*s.* 6*d.* making the above total, and a moiety is ordered out of the first money that shall come into the exchequer of the Queen's arrears."

Daniel Malthus died in 1717 and was buried at Hammersmith. His will is a very short document. "I, Daniel Malthus, of the parish of St. James', Westminster, apothecary, having by God's blessing provided for my children, do by this my last will and testament give and bequeath to my deare wife, Elizabeth Malthus, everything in the world that I have a right or title to, or interest in, and I appoint her sole executrix of my will, this 11th August, 1716." The witnesses are Simon Parry, Sarah Tully, and Elizabeth Baker, and probate was granted July 29th, 1717.

His Appointment as Queen's Apothecary.

With regard to the appointment of Malthus to be the Queen's apothecary the following document in the Public Record Office may prove of interest.

L.C. 3:21. "Whereas in the present Establishment of your office certain salaries and allowances were inserted for James Chase, Esq., and Joseph Pitt, Esq. (who is lately deceased), as apothecaries to our Royal person and it is thereby declared that upon the death or removal of either of them which should first happen the place of him so dying or being removed should cease and determine. And whereas our trusty and welbeloved Daniell Malthus, Esq., is by our discretion sworn and admitted Apothecary to our Royal person in the room of the said Joseph Pitt and it being our intention that the said Daniell Malthus shall have the same salary and allowance as was payable to the said Joseph Pitt Notwithstanding our said former direction (to wit) for his salary £115 p. ann. and for physick for our person and in lieu of bills £205 *5s.* p. ann. amounting in both to Three hundred and Twenty pounds five shillings p. ann. Our will and pleasure therefore is and we do hereby direct and comand that out of such our money as is or shall be impressed to you for the service of your office you forthwith pay or cause to be paid unto the said Daniell Malthus or his assignes so much as the said salary and allowance at the rate of £320 *5s.* p. ann. computed by the day from 22nd day of July last (being the day on wch. he was sworn into the said office) to the 29th day of Sept. following amounts unto And that from thenceforth you pay the said salary and allowance quarterly from time to time as the same shall incurr and become due in like manner as other our Servts. on the said Establishmt. are paid or payable But it is our express will and pleasure that upon the death or removall of him the said James Chase or of the sd. Danll. Malthus wch. shall first happen the place of him so first dying or being removed shall cease and determine and this shall be as well to you for making the said paymts. as to the auditors of the Imprests and all others concerned in allowing thereof from time to time upon your accots. a sufficient warrant Given at our Court at St. James's this 22nd day of Novr. 1704, in the third year of our Reign.

By Her Matys. Command. GODOLPHIN.

To our Rt. trusty and welbeloved cousin John Viscount Fitzharding. Treasr. etc."

One other extract from the records may perhaps be allowed:—"Windsor, 10, Oct. 1711. To Mr. Danll. Malthus Apothecary to Her Maties, Royall Person for physick for Her Maties. Servants that attended at Windsor and Newmarket in 1706, 1707 & 1708 and for other persons by Her Maties. speciall comand by warrant dat. 21 Febry. 1708, £108 12 9."

Malthus's Descendants.

Daniel Malthus's grandson, Daniel, of Albury, Surrey, was, according to the "Encyclopædia Britannica," "a gentleman of good family and independent fortune, a man of considerable culture both in literature and philosophy, the friend and correspondent of Rousseau and one of his executors, one, too, who showed no little interest in those social problems in which his son was to be an original inquirer." The son referred to in the last sentence was no other than the Rev. T. R. Malthus, the celebrated political economist, whose famous essay on the "Principle of Population" was published in 1798.

The practice of naming the eldest son, or other son, Sydenham has persisted till recent times. The late Colonel Sydenham Malthus, C.B., who was well-known to the writer of this paper, named two sons in succession Sydenham, but each died young. A branch of this ancient family is settled in New Zealand and the sole survivor of the English branch was at school with the writer and is now an engineer employed in the colonies.

Dr. John Arbuthnot survived his attack of stone or gravel and did not die till Feb. 27th, 1735, but Sir Edward Hannes died July 21st, 1710. The latter enjoys the distinction of appearing in a lampoon of the period in company with the notorious ophthalmic imposter, Sir William Read, Queen Anne's quack oculist.

"Great Read and slender Hannes both knights, show
That none their honours shall to merit owe.
That Popish doctrine is exploded quite,
or Ralph* had been no Duke, and Read no Knight,
That none may *virtue* or their *learning* plead,
This has no *grace* and that can hardly *read*."

*Ralph, 1st Duke of Montague.

I am indebted to Payne's "Collections for a History of the Family of Malthus" for much of the information recorded here, and to Mr. Harvey Bloom for transcribing five of the letters in the Sloane MS., and for obtaining the warrant of appointment from the Public Record Office.

SPECIMEN EXAMINATION PAPERS.

A COLLECTION of medical and D.P.H. examination papers for the years 1926 to 1929 has just been issued by Messrs. E. and S. Livingstone, of Edinburgh, for 3*s.* 6*d.* The book includes papers set at the University of Edinburgh Conjoint Board (Triple Qualification) and the Royal College of Physicians of Edinburgh, in the following subjects: Botany, Zoology, Chemistry, Physics, Anatomy, Physiology, Pathology, Materia Medica, Surgery, Medicine, Midwifery and Gynæcology, Forensic Medicine, Public Health, Bacteriology, Entomology and Parasitology, and Elementary Psychology. Parts of the book, therefore, will be useful to medical students at all stages of their career and to graduates who are preparing for higher diplomas.

ESPERANTO AND MEDICINE.

ESPERANTO, the invention of a Polish oculist, Dr. L. L. Zamenhof (1859–1917), has already proved its utility as an international auxiliary language in science, commerce, and social life—the Church might also be included, for there are esperanto translations of devotional books, both Catholic and Protestant, while the whole of the Bible and the New Testament have been translated into the language. If esperanto has not made the progress which the pioneer hoped for when he published his brochure in 1887, there are now signs that its value as an instrument for international communication with a subsequent closer linking of the nations is becoming more recognised. The League of Nations is prepared to use esperanto where its help appears probable, and the British Association for the Advancement of Science takes a similar attitude. Further, according to a recent issue of "International Language," Liverpool University, to which the late Dr. John Buchanan left £4000 for the establishment of a Chair of Esperanto, has an Esperanto Society among its general activities, of which Prof. W. E. Collinson is the president; while Oxford has a similar society, which has received recognition from the University. It is fitting, therefore, that the twenty-second Universal Congress of Esperanto should be held in Oxford from Aug. 2nd to 9th, under the Presidency of Prof. Collinson, and in this connexion a small book of 62 pages, "Esperanto and its Claims,"[1] has been written by Mr. Bernard Long, B.A. Camb., based on a previous booklet, "The Passing of Babel," which discusses the language problem and its solution and answers in brief most of the questions that are likely to arise in the minds of those seeking information.

A section of the Universal Congress has been devoted to medicine, but the auxiliary language having proved its suitability for communications among medical men of different nationalities, a separate congress was inaugurated and was held for the first time in 1929 at Antwerp. The medical esperantists have an "Internacia Medicina Revuo," which circulates in all parts of the world, while Japan has local journals which print medical communications in esperanto and by this means make known medical activities in that country to their confrères in other countries. Japan early recognised the value of esperanto as a means of overcoming the difficulties of their language to foreigners, and several medical monographs have been written in esperanto by Japanese professors of the Pathological Institute of the University of Tokio, while a treatise on pathology with esperanto terminology has also been published in Japan. In Switzerland there is a committee whose object is to interest the medical and scientific professions in esperanto, and in Czecho-Slovakia the movement seems to be slowly spreading, for there are small societies in various parts of the country, an esperanto institute at Prague, and in official circles, and particularly the Ministry of Education, it is favourably regarded as an auxiliary language.

HOLIDAY TOURS.

THE Union Castle Mail Steamship Company are issuing, in connexion with their various tours projected for the summer, a series of interesting pamphlets. The continental cruises are planned fortnightly, commencing April 26th, and the tourists have an opportunity of visiting Antwerp, Rotterdam, and Hamburg for the modest sum of about £20, while they will be absent 13 or 14 days. A trip to Madeira, the Grand Canary, and Teneriffe, can be made for about the same money. The whole trip to Madeira and back can, if necessary, be made in nine days, but opportunities of extension are offered up to any period within two months, the rates being proportionate. A tour to South Africa is offered at specially reduced return fares; the places visited are Cape Town, Algoa Bay, East London, and Natal. For particulars concerning these summer tours, as well as for information upon any of the sailings, application should be made direct to the Company at 3, Fenchurch-street, London, E.C.

A PHOTOGRAPHER'S CALENDAR.

THE British Journal Photographic Almanac, 1930,[2] should prove useful to those who are engaged in any branch of photographic work. The technical information contained in the book includes tables and formulæ, an account of home-made appliances, and an epitome of methods and processes described in photographic literature during the year. An article on the triumphs of interior photography, the editor's reminiscences of the stages through which photography has passed during the last 25 years, and a note on the method of taking telephoto snapshots will be read with interest. The book is illustrated with some beautiful reproductions of photographs.

[1] This booklet and further information is obtainable from the British Esperanto Association, 142, High Holborn, London, W.C.

[2] Edited by George E. Brown, F.I.C. London: Henry Greenwood and Co. Pp. 784. 2s.

SCOTLAND AND MEDICAL EDUCATION.

OUR Scottish correspondent remarked in a recent issue (March 22nd, p. 657) on the large part played by Scottish medical schools in the medical education of the kingdom. No one would want to challenge Scottish supremacy in this respect, but it has been pointed out to us that while the Scottish schools are insistent on all their students registering, this is not the case in the English schools, so that the Students' Register does not give an accurate basis for comparison. London and Liverpool Universities, for instance, as well as the Conjoint Board, do not insist upon the registration of their medical students with the General Medical Council. A statistical table to be found in the Council's Minutes for 1928 (p. 440) shows that nearly 21 per cent. of medical students do not register, and the bulk of omissions are in England. It may be taken that students who register as such in one country generally qualify and are registered as practitioners in the same country, although there is no insistence on this. Whether or not there has been an increase in the number of students in Scotland as compared with those in England it would be difficult to say. That there has been a falling off in the number of English students at Edinburgh University is suggested by the lapse of the English public schools club for want of members. Probably there has been little change in recent years.

NEW PREPARATIONS.

COMPOUND GLYCERIN OF THYMOL PASTILLES (Boots Drug Co., Nottingham).—These pastilles contain the equivalent of one-third of a teaspoonful of glycerin of thymol, and are recommended as a substitute for the glycerin thymol gargles. When an application is required in case of sore throat or tonsillitis they will be found quite serviceable, but obviously such treatment should only be undertaken on medical advice.

REGULOL (Cuxon, Gerrard and Co., Ltd., Oldbury, Birmingham).—This preparation is manufactured from liquid paraffin in combination with agar-agar, and has been found acceptable by patients for whom the natural taste of the oil is very unpalatable, while the addition of agar-agar assists to obviate rectal leakage. The manufacturers have evidence that the drug has been particularly valuable in cases of hæmorrhoids. Regulol is available in two forms, plain or compound, the latter form being a combination made by adding phenolphthalein in the proportion of 4 grains per ounce; this is indicated where the condition of constipation is more obstinate. A sensible direction is given on the bottle, when mentioning the doses, that these can be reduced as the bowel resumes its normal function.

RECURRENT ATTACKS OF SORE TONGUE.

IN reply to the inquiry in THE LANCET of March 8th (p. 548) Dr. Byron H. Jackson (Scranton, Pennsylvania) writes:—"I have treated several such cases, which started with sudden enlargement of the papilla, followed by small ulcers on the sides, some of which became chronic, one patient suffered continually for eighteen months. When she was sent to me she had had many different kinds of treatments, none of which gave her relief. I give a mouth-wash of hydrogen peroxide, 50 per cent. strength, to be used three times daily, after the mouth has been cleansed thoroughly with warm water, and once daily a dental cotton dam is placed in the mouth around the tongue so that the tongue is kept perfectly dry, and the top of the tongue is dried with cotton; then I apply, with a tiny cotton swab, a 5 per cent. solution of salvarsan with glucose. In every instance this permanently cured the condition. There appears to be some connexion between this type of sore tongue and so-called Vincent's angina. In my cases the organism was not isolated. I am therefore working somewhat in the dark."

Messrs. Baillière, Tindall and Cox, and H. K. Lewis and Co., Ltd., ask us to state that the use of their names in an advertisement last week of Dr. Blanchard's "Ambulant Proctology" was without their knowledge or consent.

ANCOATS HOSPITAL.—The relative failure of the appeal for £100,000 for enlargement had necessitated the abandonment of the original scheme. A much modified plan has now been adopted. On the ground that the provision of additional beds would add to the pressure upon the operating theatre and other departments, and require a larger number of nurses, it has been decided to build a new block, providing two new theatres and new pathological and massage departments. Since 1925 the average stay of each patient has been reduced from 16·2 days to 13·8 days. There is a waiting-list of about 1500.